ORDER NO. HAD8603408C0
A2

Service Manual

Stereo Integrated Amplifier

Amplifier
SU-V60

Color	Area
(K)	[M] ..... U.S.A.
(K)	[MC] .... Canada
(K)(S)	[E] ..... Continental Europe
(K)(S)	[EH] .... Holland
(K)(S)	[EB] .... Belgium
(K)(S)	[EF] .... France
(K)(S)	[EK] .... United Kingdom
(K)(S)	[EGA] ... F.R. Germany
(K)(S)	[Ei] ..... Italy
(K)(S)	[XL] .... Australia
(K)(S)	[XA] .... Asia, Latin America, Middle Near East, Africa & Oceania

Color
(K) .... Black Type
(S) .... Silver Type

SPECIFICATIONS

(* Refer to next page, specification of DIN 45 500)

(IHF '78)

■ AMPLIFIER SECTION

Rated minimum sine wave RMS power output
20 Hz~20 kHz both channels driven
0.002% total harmonic distortion
90W per channel (8 ohms)

1 kHz continuous power output	
both channels driven	
0.0009% total harmonic distortion	
	90W per channel (8 ohms)
0.005% total harmonic distortion	
	100W per channel (4 ohms)
Dynamic headroom	1 dB (8 ohms)
	1.4 dB (4 ohms)
Headphones output impedance	(330 ohms)
Total harmonic distortion	
rated power at 20 Hz~20 kHz	0.002% (8 ohms)
rated power at 1 kHz	0.0009% (8 ohms)
	0.005% (4 ohms)
half power at 20 Hz~20 kHz	0.002% (8 ohms)
half power at 1 kHz	0.0008% (8 ohms)
	0.002% (4 ohms)
SMPTE intermodulation distortion	0.005% (8 ohms)
Frequency response	
PHONO	RIAA standard curve ±0.8 dB
TUNER, CD, AV/AUX, TAPE 1/DA TAPE	
TAPE 2	+0 dB, −0.2 dB (20 Hz~ 20 kHz)
	5 Hz~120 kHz, −3 dB
Input sensitivity	
PHONO MM	0.25 mV (2.5 mV, IHF '66)
MC	17 μV (170 μV, IHF '66)
TUNER, CD, AV/AUX	15 mV (150 mV, IHF '66)
TAPE 1/DA TAPE, TAPE 2	
Maximum input voltage	
PHONO MM	160 mV
MC	12 mV
S/N (IHF, A)	
PHONO MM	76 dB (86 dB, IHF '66)
MC	72 dB (68 dB, IHF '66)
	(250 μV)
TUNER, CD, AV/AUX, TAPE 1/DA TAPE	
TAPE 2	80 dB (100 dB, IHF '66)
Input impedance	
PHONO MM	47 kilohms
MC	220 ohms
TUNER, CD, AV/AUX, TAPE 1/DA TAPE	
TAPE 2	22 kilohms
Tone controls	
BASS	50 Hz, +10 dB~−10 dB
TREBLE	20 kHz, +10 dB~−10 dB
Subsonic filter	20 Hz, −6 dB/oct.
Loudness control (volume at −30 dB)	50 Hz, +9 dB
Output voltage	
TAPE 1, 2 REC OUT	150 mV
Low frequency damping factor	60 (8 ohms)
	30 (4 ohms)
Load impedance	
MAIN or REMOTE	4~16 ohms
MAIN and REMOTE	8~16 ohms

■ GENERAL

Power consumption	380W, 440 VA
Power supply	AC 120V, 60 Hz
Dimensions (W×H×D)	430 × 116 × 340 mm
	(16-15/16" × 4-9/16" × 13-6/16")
Weight	8.5 kg (18.8 lb.)

Note:
Total harmonic distortion is measured by the digital spectrum analyzer (H.P. 3045 system).

Specifications are subject to chnge without notice for further improvement.

Technics

Matsushita Service Company
50 Meadowland Parkway,
Secaucus, New Jersey 07094

Panasonic Hawaii, Inc.
91-238 Kauhi St., Ewa Beach
P.O. Box. 774
Honolulu, Hawaii 96808-0774

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

Panasonic Sales Company,
Division of Matsushita Electric
of Puerto Rico, Inc.
Ave. 65 De Infanteria, KM 9.7
Victoria, Industrial Park
Carolina, Puerto Rico 00630

Matsushita Electric
of Canada Limited
5770 Ambler Drive, Mississauga,
Ontario, L4W 2T3

SPECIFICATIONS (DIN 45 500)

AMPLIFIER SECTION

20 Hz~20 kHz continuous power output	
both channels driven	2 × 90W (8Ω)
1 kHz continuous power output	
both channels driven	2 × 120W (4Ω)
Total harmonic distortion	
rated power at 20 Hz~20 kHz	0.002% (8Ω)
rated power at 1 kHz	0.005% (4Ω) 0.0009% (8Ω)
half power at 20 Hz~20 kHz	0.002% (8Ω)
half power at 1 kHz	0.002% (4Ω) 0.0008% (8Ω)
Intermodulation distortion	
rated power at 250 Hz: 8 kHz=4:1, 8Ω	0.005%
rated power at 60 Hz: 7 kHz=4:1, SMPTE, 8Ω	0.005%
Power bandwidth	
both channels driven, −3 dB	5 Hz~60 kHz (8Ω, 0.03%)
Residual hum and noise	0.8 mV
Damping factor	30 (4Ω), 60 (8Ω)
Input sensitivity and impedance	
PHONO MM	2.5 mV/47kΩ
MC	170 μV/220Ω
TUNER, CD, AV/AUX, TAPE 1/DA TAPE	
TAPE 2	150 mV/22kΩ
PHONO maximum input voltage (1 kHz, RMS)	
MM	160 mV
MC	12 mV
S/N	
rated power (4Ω)	
PHONO MM	78 dB (86 dB, IHF, A)
MC	65 dB (68 dB, IHF, A)
TUNER, CD, AV/AUX, TAPE 1/DA TAPE	
TAPE 2	92 dB (IHF, A: 100 dB)
−26 dB power (4Ω)	
PHONO MM	69 dB
MC	65 dB
TUNER, CD, AV/AUX, TAPE 1/DA TAPE	
TAPE 2	70 dB
50 mW power (4Ω)	
PHONO MM	62 dB
MC	61 dB
TUNER, CD, AV/AUX, TAPE 1/DA TAPE	
TAPE 2	63 dB
Frequency response	
PHONO	RIAA standard curve ±0.8 dB (30 Hz~15 kHz)
TUNER, CD, AV/AUX, TAPE 1/DA TAPE	
TAPE 2	5 Hz~120 kHz (−3 dB) +0, −0,2 dB (20 Hz~20 kHz)
Tone controls	
BASS	50 Hz, +10 dB~−10 dB
TREBLE	20 kHz, +10 dB~−10 dB
Subsonic filter	20 Hz, −6 dB/oct.
Loudness control (volume at −30 dB)	50 Hz, +9 dB
Output voltage and impedance	
TAPE, 1, 2 REC OUT	150 mV
Channel balance, AUX 250 Hz~6,300 Hz	±1 dB
Channel separation, AUX 1 kHz	50 dB
Headphones output level and impedance	600 mV/330Ω
Load impedance	
MAIN or REMOTE	4Ω~16Ω
MAIN and REMOTE	8Ω~16Ω

GENERAL

Power consumption	560W
Power supply	
For United Kingdom and Australia	AC 50 Hz/60 Hz, 240V
For continental Europe	AC 50 Hz/60 Hz, 220V
For others	AC 50 Hz/60 Hz, 110V/127V/220V/240V
Dimensions (W×H×D)	430 × 116 × 340 mm (16-15/16" × 4-9/16" × 13-6/16")
Weight	8.5 kg (18.8 lb.)

Notes:

1. Specifications are subject to change without notice. Weight and dimensions are approximate.
2. Total harmonic distortion is measured by the digital spectrum analyzer (H.P. 3045 system).

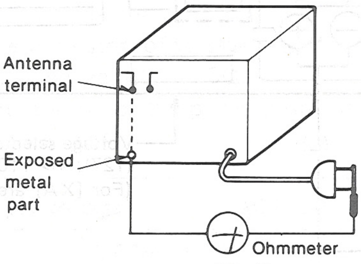
SAFETY PRECAUTION (This "safety precaution" is applied only in U.S.A.)

1. Before servicing, unplug the power cord to prevent an electric shock.
2. When replacing parts, use only manufacturer's recommended components for safety.
3. Check the condition of the power cord. Replace if wear or damage is evident.
4. After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shields, etc.
5. Before returning the serviced equipment to the customer, be sure to make the following insulation resistance test to prevent the customer from being exposed to a shock hazard.

• INSULATION RESISTANCE TEST

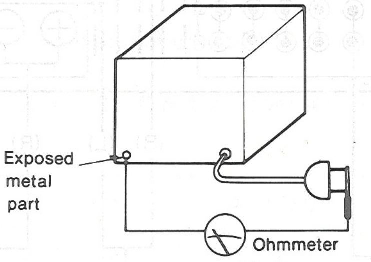
1. Unplug the power cord and short the two prongs of the plug with a jumper wire.
2. Turn on the power switch.
3. Measure the resistance value with ohmmeter between the jumpered AC plug and each exposed metal cabinet part, such as screwheads antenna, control shafts, handle brackets, etc. Equipment with antenna terminals should read between 3MΩ and 5.2MΩ to all exposed parts. (Fig. A) Equipment without antenna terminals should read approximately infinity to all exposed parts. (Fig. B)

Note: Some exposed parts may be isolated from the chassis by design. These will read infinity.



(Fig. A)

Resistance = 3MΩ—5.2MΩ



(Fig. B)

Resistance = Approx ∞

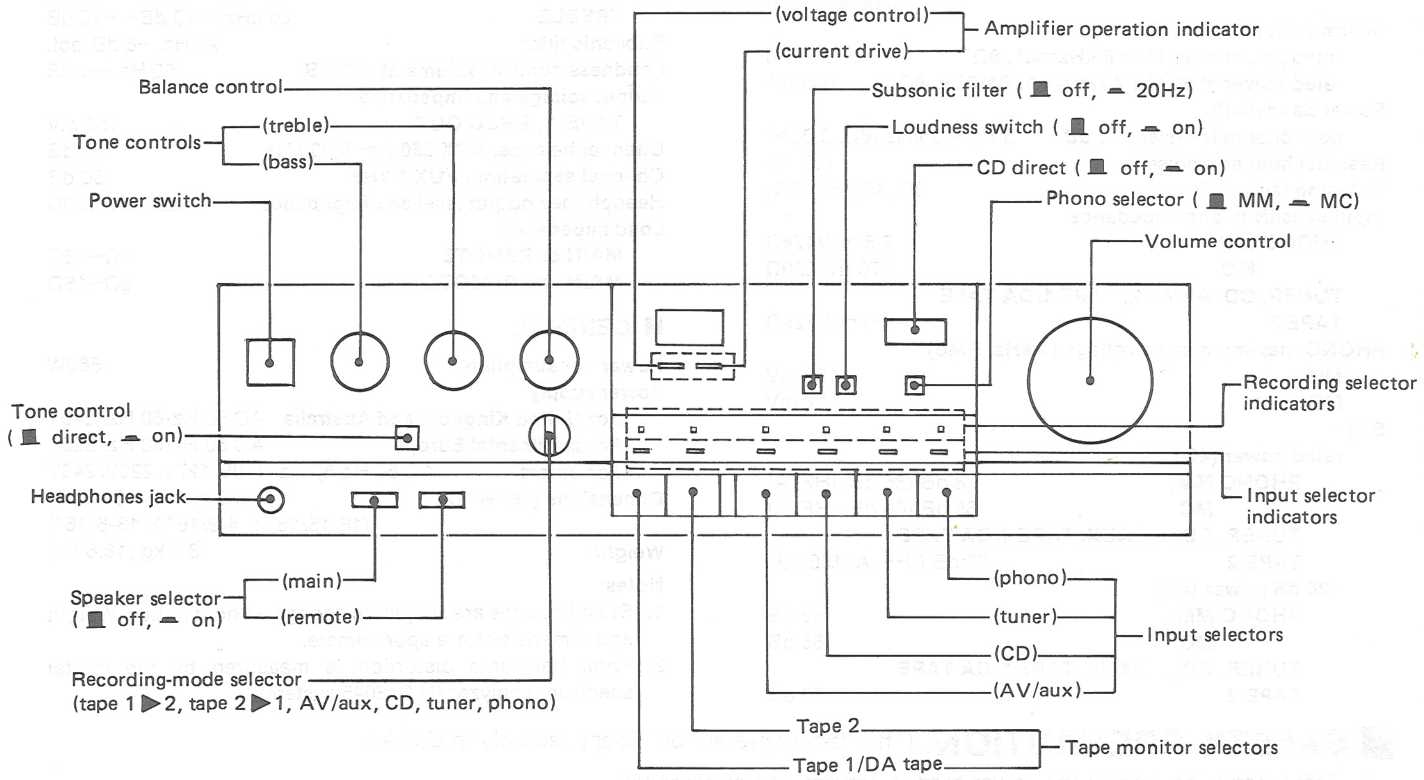
4. If the measurement is outside the specified limits, there is a possibility of a shock hazard. The equipment should be repaired and rechecked before it is returned to the customer.

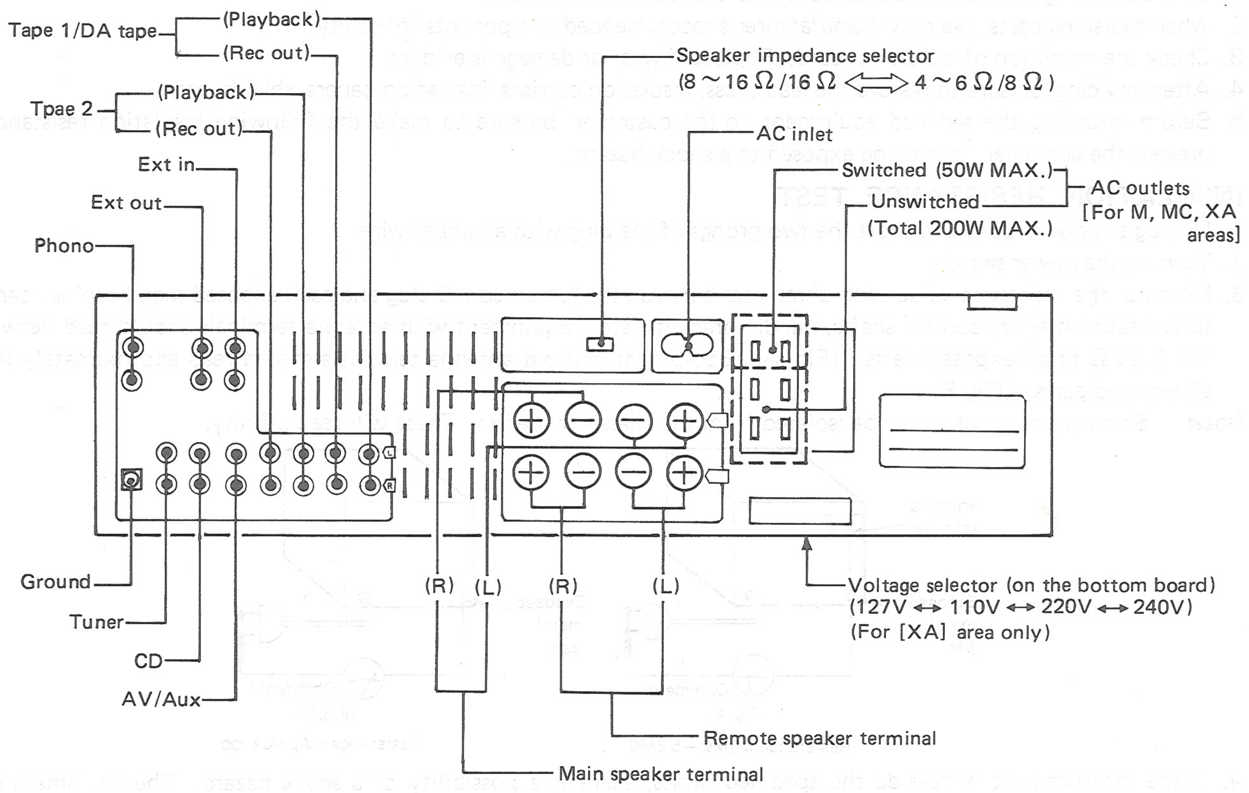
■ CONTENTS

Page
SAFETY PRECAUTION 2
LOCATION OF CONTROLS 3
PROTECTION CIRCUITRY 4
BEFORE REPAIR AND ADJUSTMENT 4
DISASSEMBLY INSTRUCTIONS 5, 6
MEASUREMENTS AND ADJUSTMENTS 6
BLOCK DIAGRAM 7, 8

Page
PRINTED CIRCUIT BOARDS .... 9 ~ 14
CIRCUIT BOARDS AND WIRING CONNECTION DIAGRAM .... 15 ~ 16
SCHEMATIC DIAGRAM .... 17 ~ 21
REPLACEMENT PARTS LIST .... 22 ~ 23
EXPLODED VIEW 24, 25

■ LOCATION OF CONTROLS


(voltage control)
(current drive)
Amplifier operation indicator
Balance control
Subsonic filter (■ off, ▬ 20Hz)
Tone controls
(treble)
(bass)
Loudness switch (■ off, ▬ on)
Power switch
CD direct (■ off, ▬ on)
Phono selector (■ MM, ▬ MC)
Volume control
Recording selector indicators
Tone control (■ direct, ▬ on)
Headphones jack
Input selector indicators
(main)
Speaker selector (■ off, ▬ on)
(remote)
(phono)
(tuner)
(CD)
(AV/aux)
Input selectors
Recording-mode selector (tape 1 ▶2, tape 2 ▶1, AV/aux, CD, tuner, phono)
Tape 2
Tape 1/DA tape
Tape monitor selectors


Tape 1/DA tape
(Playback)
(Rec out)
Tpae 2
(Playback)
(Rec out)
Ext in
Ext out
Phono
Speaker impedance selector (8 ~ 16 Ω/16 Ω <=> 4 ~ 6 Ω/8 Ω)
AC inlet
Switched (50W MAX.)
Unswitched
AC outlets [For M, MC, XA areas]
(Total 200W MAX.)
Ground
Tuner
CD
AV/Aux
(R) (L) (R) (L)
Voltage selector (on the bottom board) (127V ↔ 110V ↔ 220V ↔ 240V) (For [XA] area only)
Remote speaker terminal
Main speaker terminal

- The power supply for this unit varies depending upon the areas. Also, the parts used for power supply are different. So, refer to the circuit diagram and replacement parts list.

* [M] [MC] area is provided with AC outlets.
* 120V (60Hz) for U.S.A.
* [XA] area is provided with voltage selector and AC outlets.
* 240V (50/60Hz) for Australia and United Kingdom.
* 220V (50/60Hz) for Continental Europe.
* 127V/110V/220V/240V (50/60Hz) for other [XA] area.
* Phono input capacitance is about 150pF.

Suggestions

- If noise is very annoying while listening to an FM or AM broadcast, switch OFF the video disc player, compact-disc player and turntable.
- Switch OFF the video disc player power if noise is excessive while listening to an audio tape, compact disc or regular phono disc.

Notes:

- To record sounds from a compact disc, press the input selector marked "CD".
The compact-disc-direct switch is for listening only; it cannot be used to select the compact disc as a recording source.

■ PROTECTION CIRCUITRY

The protection circuitry may have operated if either of the following conditions is noticed:

- No sound is heard when the power is switched ON.
- Sound stops during a performance.

The function of this circuitry is to prevent circuitry damage if, for example, the positive and negative speaker connection wires are "shorted", or if speaker systems with an impedance less than the indicated rated impedance of this unit are used.
If this occurs, follow the procedure outlined below:

1. Switch OFF the power.
2. Determine the cause of the problem and correct it.
3. Switch ON the power once again.

Note:
When the protection circuitry functions, the unit will not operate unless the power is first switched OFF and then ON again.

■ BEFORE REPAIR AND ADJUSTMENT

(1) Turn off the power supply. Using a 10Ω, 5W resistor, shortcircuit both ends of power supply capacitors (C503, C504, 6800μF) in order to discharge the voltage.

(2) Before turning on the power switch of the set . . .

A. Connect the voltage controller to the primary side.
B. Connect the AC ampere meter to the primary side or connect the DC voltage metar to the "±B" circuit of the secondary side.
C. Turn the VR of ICQ (VR401 and VR402) to minimum (counterclockwise).
D. After setting the output to zero of the voltage contoller, turn on the power switch of the set.
And increase the output of voltage controller gradually.
Then, check carefully whether the current value of primary side become more than followings value or whether the DC voltage of secondary side is increasing slowly.
E. If the value of current is increasing unusually or the DC voltage is not increasing, lower the output level of voltage contoller immediately.
F. Check the transistors of voltage amplifier and current amplifier IC501.
G. After repairing, adjust the ICQ.

- The current value of the primary side at no signal. (Confirm the power supply voltage of each area and provided voltage of the set.)

Power supply voltage		AC110V	AC120V	AC127V	AC220V	AC240V
Consumed current	50/60Hz	280 ~ 560mA	260 ~ 520mA	260 ~ 520mA	140 ~ 280mA	130 ~ 260mA

DISASSEMBLY INSTRUCTIONS

Ref. No. 1

How to remove the front panel

Procedure 1

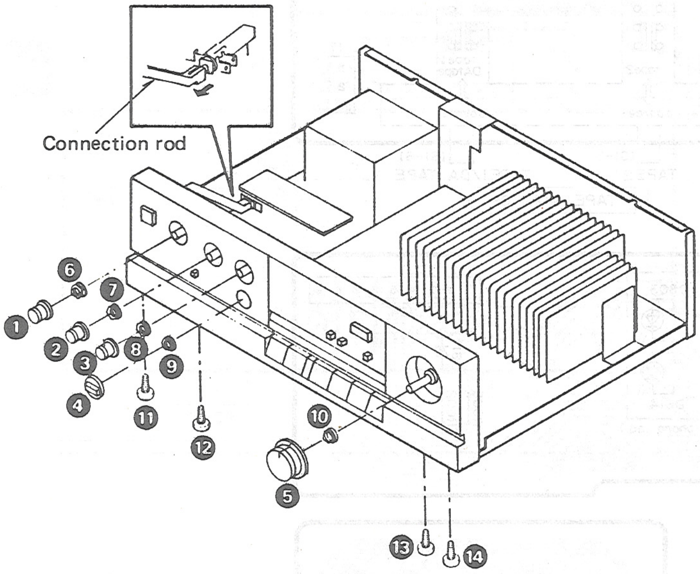
1. Remove the connection rod.
2. Remove the 5 knobs (① ~⑤).
3. Remove the 5 nuts (⑥ ~ ⑩).
4. Remove the 4 screws (⑪ ~ ⑭).
5. Remove the connector (J102 ~ J105, J118, J119).
6. Remove the 1 lock pin (⑮).
7. Remove the "Rec-select" switch (⑯).

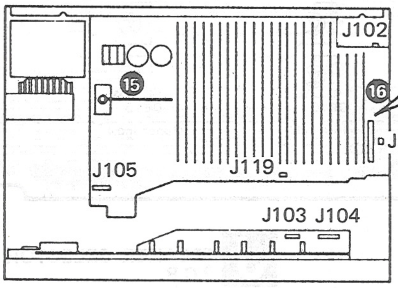
- **How to remove the "Rec-select" switch**

  Pusing the rec switch, shift it up as in Fig. 1.

- **How to fit the rec switch**

(1) Shift the switch contact inside.
(2) Turn the "Rec-select" switch (selector knob) counterclockwise.
(3) Let the "Rec-select" switch claw change with the switch, and shift the "Rec-select" switch down while pusing in.


Connection rod
①
②
③
④
⑤
⑥
⑦
⑧
⑨
⑩
⑪
⑫
⑬
⑭


J102
⑮
⑯
J118
J105
J119
J103 J104

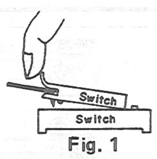

Switch
Switch

Fig. 1

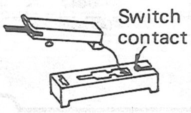

Switch contact

Fig. 2

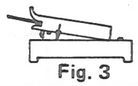


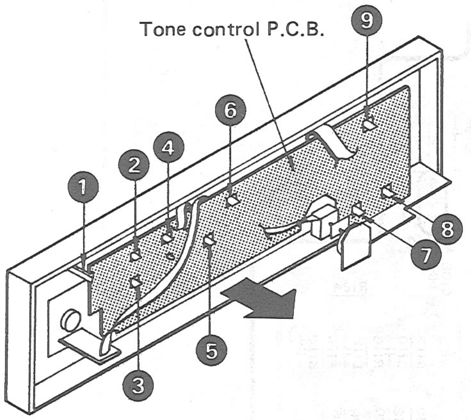
Fig. 3

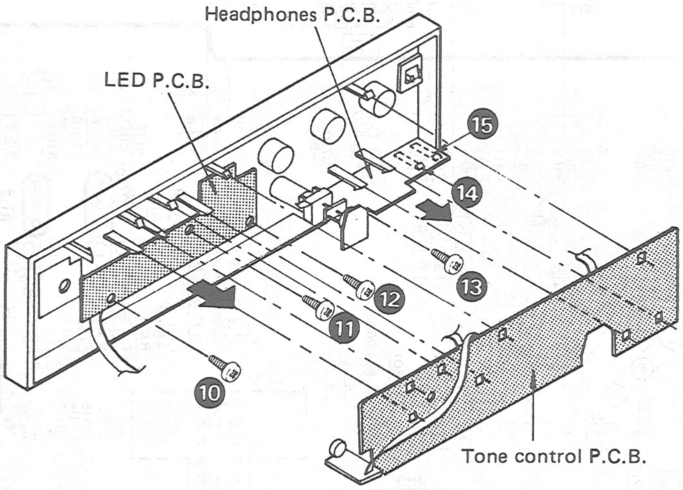
Ref. No. 2

How to remove the P.C.B.

Procedure 1 → 2

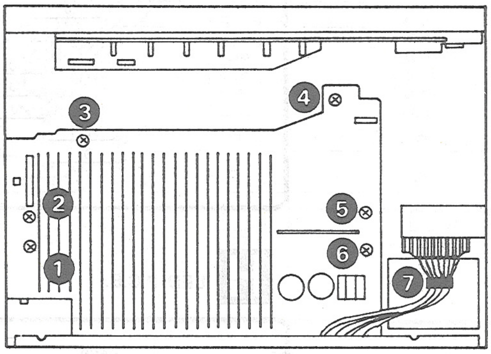
1. Push the 9 tabs (① ~ ⑨).
2. Remove the tone control P.C.B.
3. Remove the 3 screws (⑩ ~ ⑫).
4. Remove the LED P.C.B.
5. Remove the 1 screw (⑬).
6. Push the 2 tabs (⑭ , ⑮).
7. Remove the headphones P.C.B.

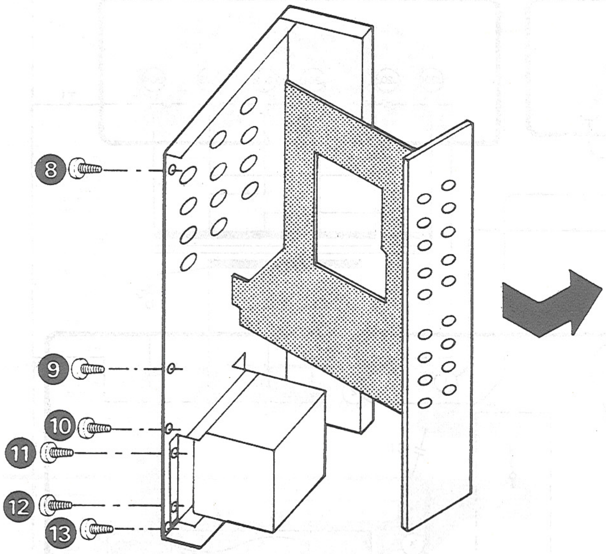

Tone control P.C.B.
①
②
③
④
⑤
⑥
⑦
⑧
⑨


Headphones P.C.B.
LED P.C.B.
⑩
⑪
⑫
⑬
⑭
⑮
Tone control P.C.B.

Ref. No. 3	How to remove the main P.C.B.

1. Remove the 6 screws (❶ ~ ❻).
2. Cut the clamper (❼).
3. Remove the 6 screws (❽ ~ ⓭).
4. Remove the main P.C.B.





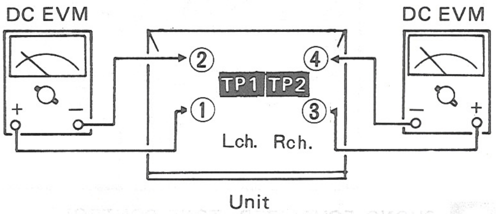
MEASUREMENTS AND ADJUSTMENTS

Control positions and equipment used.

- Volume knob . . . . ∞ (Minimum)
- Main speaker selector . . . . off
- Remote speaker selector . . . . off
- Speaker impedance switch . . . . . . 8Ω ~ 16Ω
- DC electronic voltmeter (EVM)

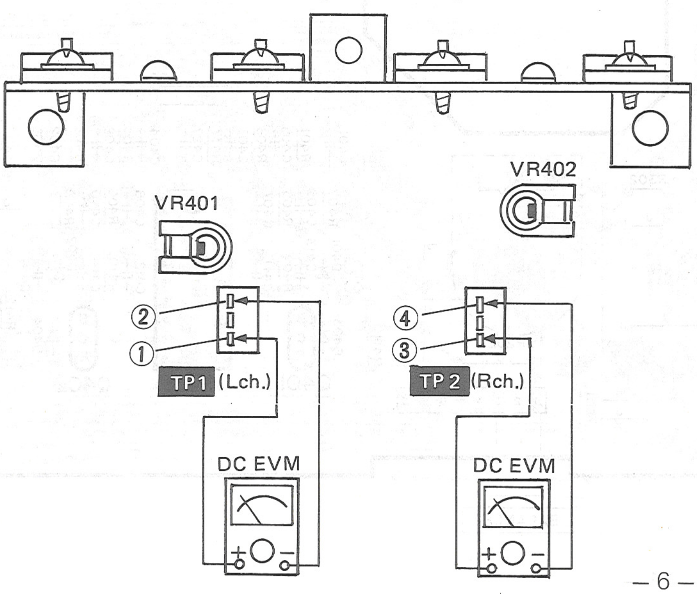
IDLING (ICQ) ADJUSTMENT

1. Test equipment connection is shown in figure. Connect the DC EVM. on both channels.)
2. Turn the ICQ control volume (**VR401, VR402**) counter-clockwise.
3. Turn ON the set when it is cold, and 15 sec. later, adjust **VR401** and **VR402** so that the voltage is **20mV.** Also, check that the voltage is **18 – 47mV** (standard: **40mV**) after lapse of **10 – 15 minutes.** (Below **50mV** after lapse of **60 min.**).

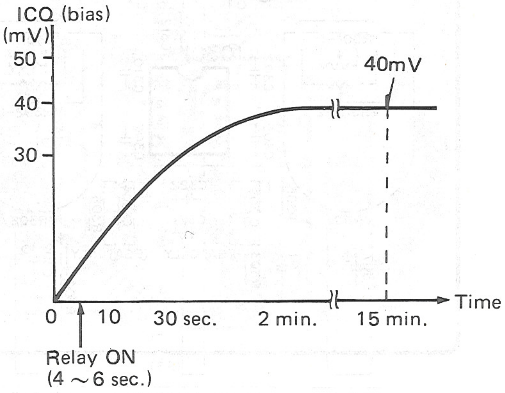


DC EVM
DC EVM
②
④
TP1
TP2
①
③
Lch.
Rch.
Unit

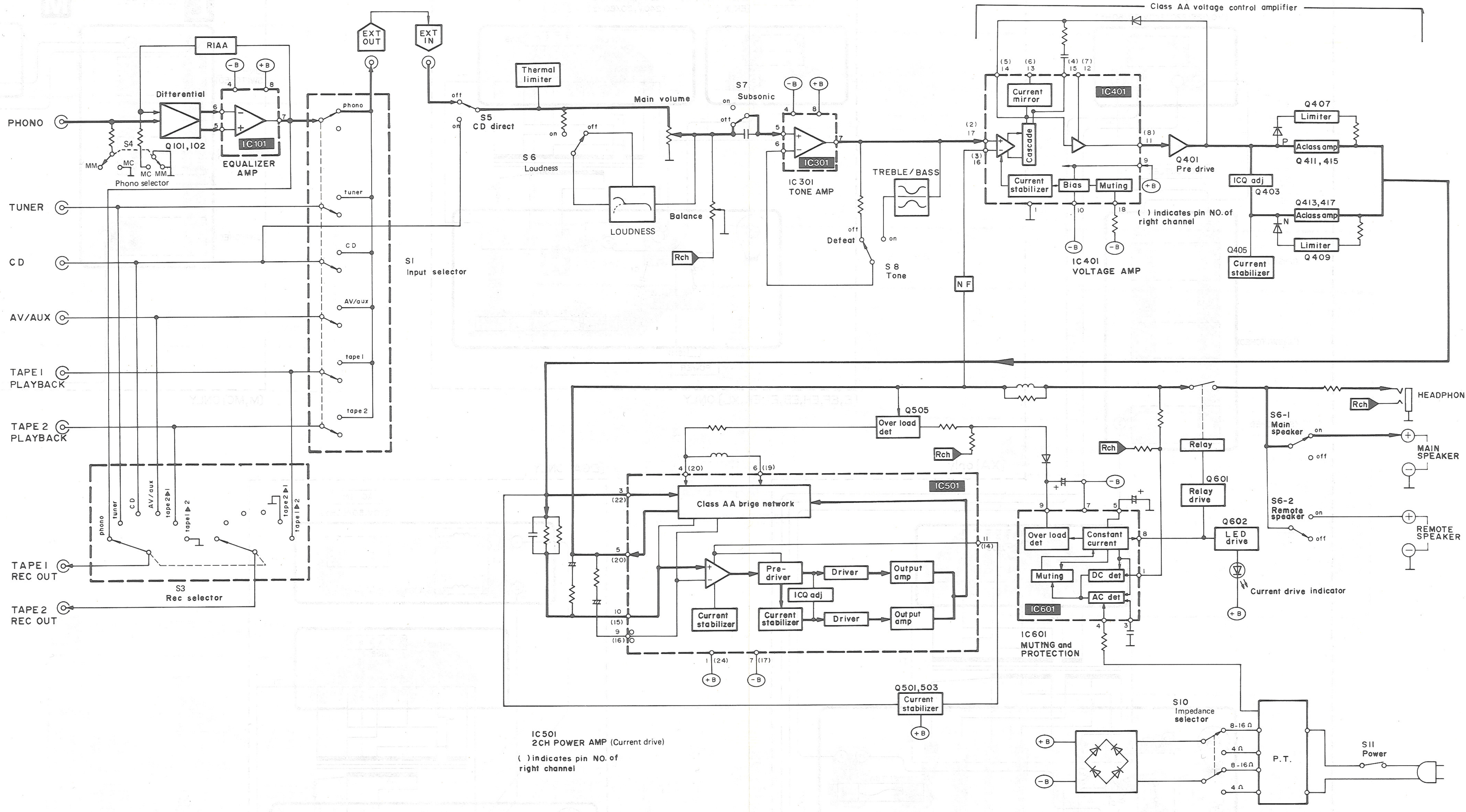
- **Adjustment points**



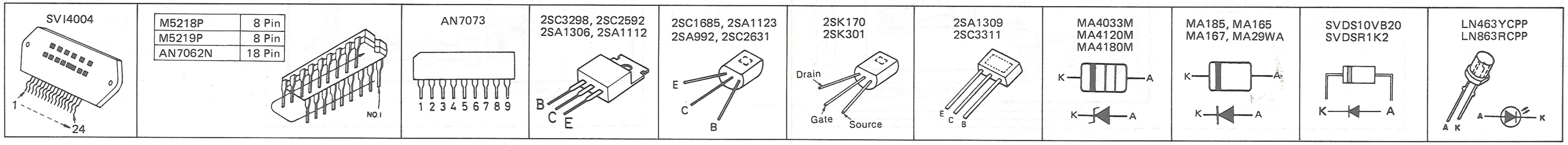
Voltage control Amp.
VR402
VR401
②
①
TP1 (Lch.)
④
③
TP 2 (Rch.)
DC EVM
DC EVM



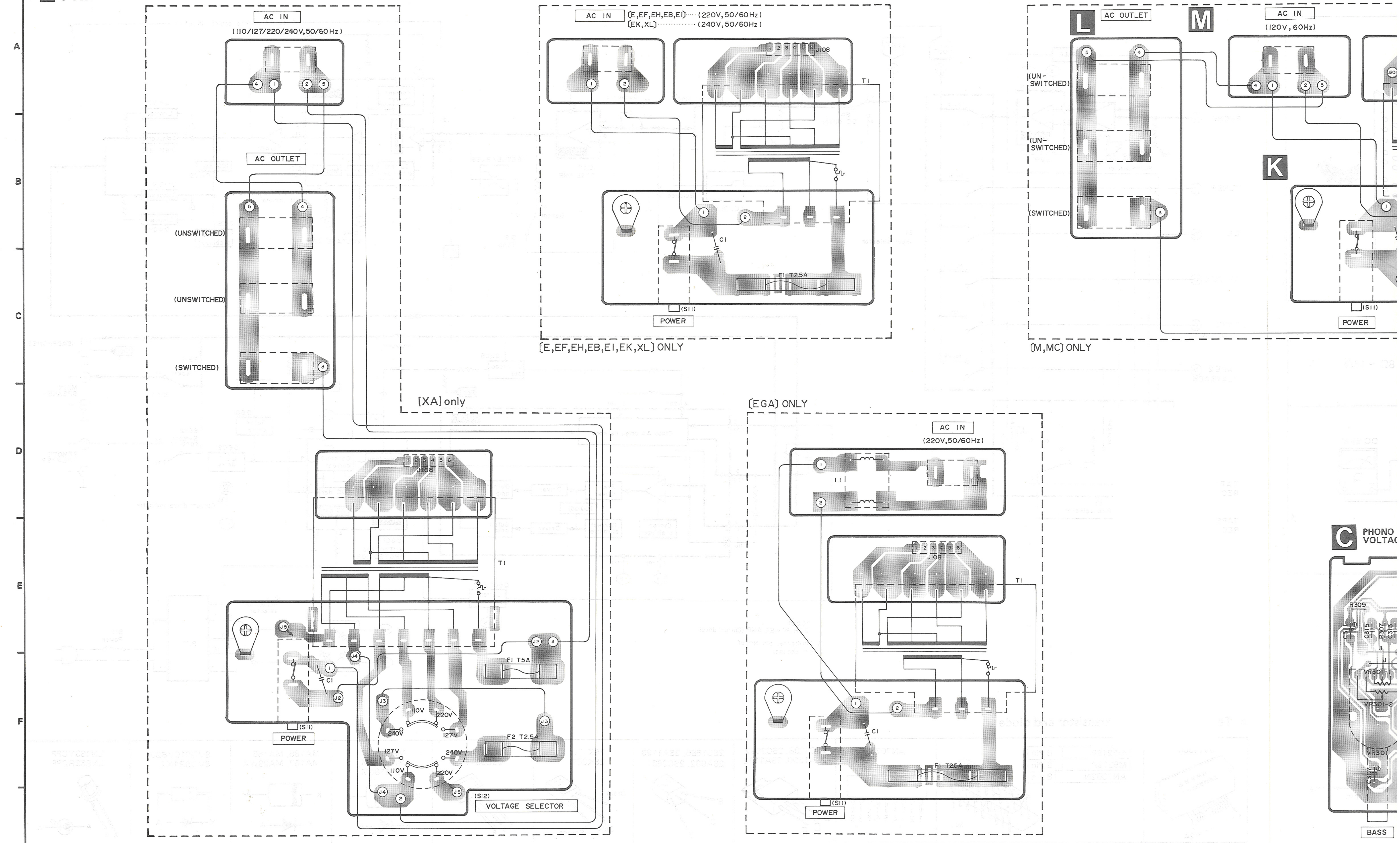
BLOCK DIAGRAM

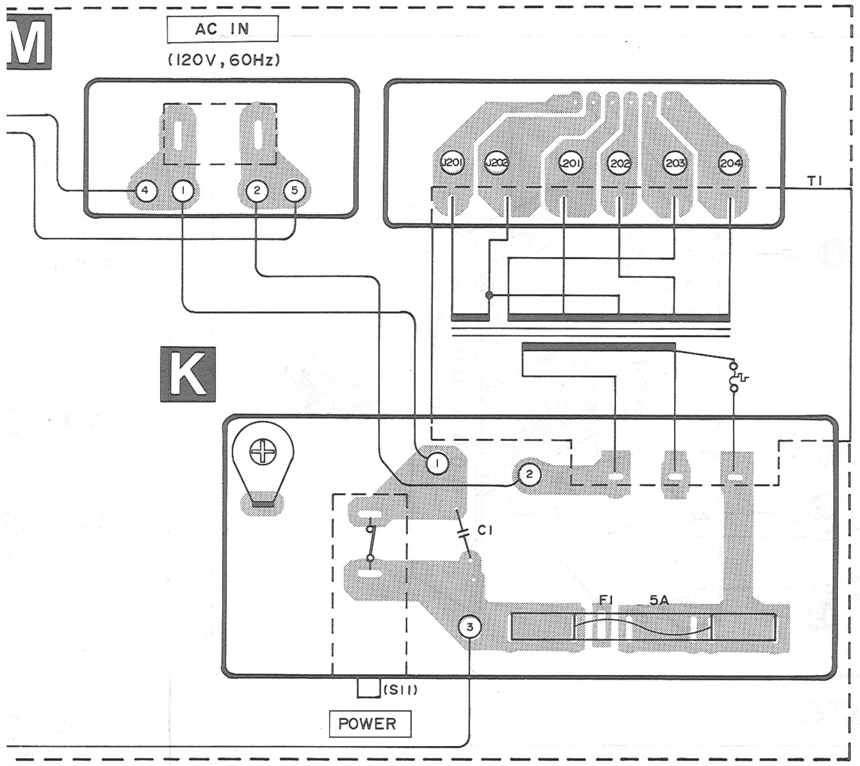

PHONO
RIAA
Differential
Q101,102
IC101
EQUALIZER AMP
S4
MM
MC
Phono selector
EXT OUT
EXT IN
phono
tuner
CD
AV/aux
tape 1
tape 2
S1 Input selector
TUNER
CD
AV/AUX
TAPE 1 PLAYBACK
TAPE 2 PLAYBACK
TAPE 1 REC OUT
TAPE 2 REC OUT
S3 Rec selector
Thermal limiter
S5 CD direct
on
off
Main volume
S6 Loudness
LOUDNESS
Balance
Rch
S7 Subsonic
IC301
IC 301 TONE AMP
TREBLE/BASS
Defeat
S8 Tone
NF
Class AA voltage control amplifier
Current mirror
IC401
Cascade
Current stabilizer
Bias
Muting
( ) indicates pin NO. of right channel
IC401 VOLTAGE AMP
Q401 Pre drive
Q407 Limiter
Aclass amp
Q411, 415
ICQ adj
Q403
Q413,417
Q405 Current stabilizer
Q409
P
N
HEADPHONES
Q505 Over load det
IC501
Class AA brige network
Pre-driver
Driver
Output amp
ICQ adj
Current stabilizer
IC501 2CH POWER AMP (Current drive)
( ) indicates pin NO. of right channel
Q501,503 Current stabilizer
Over load det
Constant current
Muting
DC det
AC det
IC601
IC601 MUTING and PROTECTION
Relay
Q601 Relay drive
Q602 LED drive
Current drive indicator
S6-1 Main speaker
MAIN SPEAKER
S6-2 Remote speaker
REMOTE SPEAKER
S10 Impedance selector
8-16 Ω
4 Ω
P.T.
S11 Power
+B
−B

Terminal guide of IC, transistor and diode

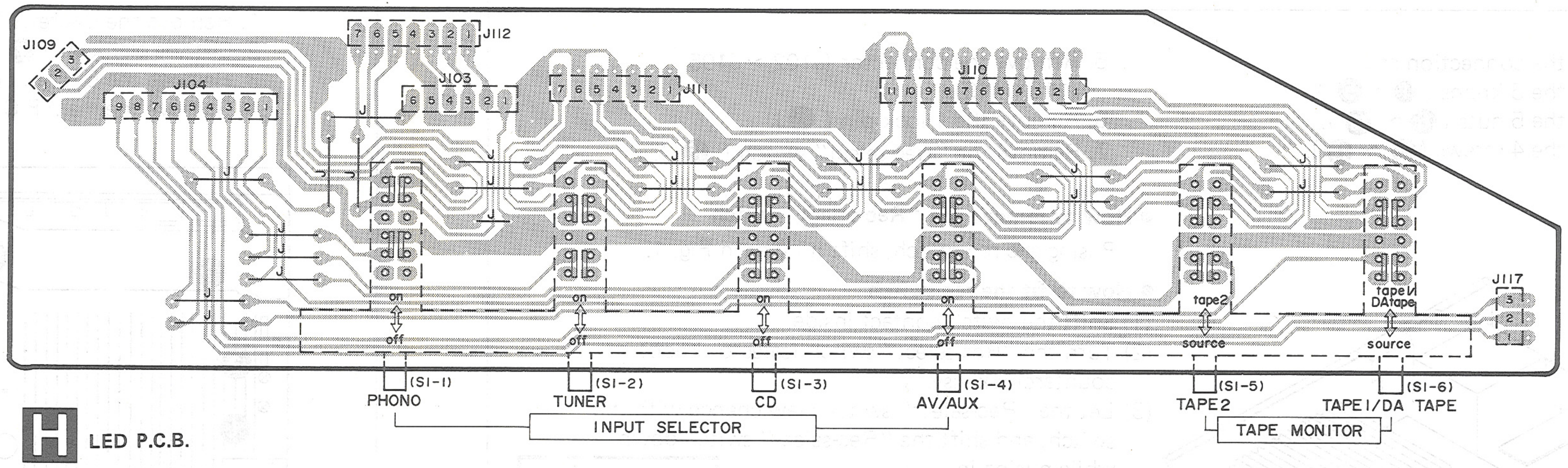

SVI4004
1
24
M5218P 8 Pin
M5219P 8 Pin
AN7062N 18 Pin
NO.1
AN7073
1 2 3 4 5 6 7 8 9
2SC3298, 2SC2592
2SA1306, 2SA1112
B C E
2SC1685, 2SA1123
2SA992, 2SC2631
E C B
2SK170
2SK301
Drain
Gate
Source
2SA1309
2SC3311
E C B
MA4033M
MA4120M
MA4180M
K A
MA185, MA165
MA167, MA29WA
K A
SVDS10VB20
SVDSR1K2
K A
LN463YCPP
LN863RCPP
A K

PRINTED CIRCUIT BOARDS AND WIRING CONNECTION DIAGRAM


AC IN
(110/127/220/240V,50/60Hz)
AC OUTLET
(UNSWITCHED)
(UNSWITCHED)
(SWITCHED)
J108
T1
J5
J4
J3
J2
C1
F1 T5A
F2 T2.5A
110V
220V
240V
127V
(S11)
POWER
(S12)
VOLTAGE SELECTOR
[XA] only
AC IN
(E,EF,EH,EB,EI)····(220V,50/60Hz)
(EK,XL)·············(240V,50/60Hz)
J108
T1
C1
F1 T2.5A
(S11)
POWER
(E,EF,EH,EB,EI,EK,XL) ONLY
L
AC OUTLET
M
AC IN
(120V,60Hz)
(UN-SWITCHED)
(UN-SWITCHED)
(SWITCHED)
K
(S11)
POWER
(M,MC) ONLY
(EGA) ONLY
AC IN
(220V,50/60Hz)
L1
J108
T1
C1
F1 T2.5A
(S11)
POWER
C
PHONO
VOLTAG
R309
C311
C315
R307
C313
VR301-1
VR301-2
VR301
C307
BASS

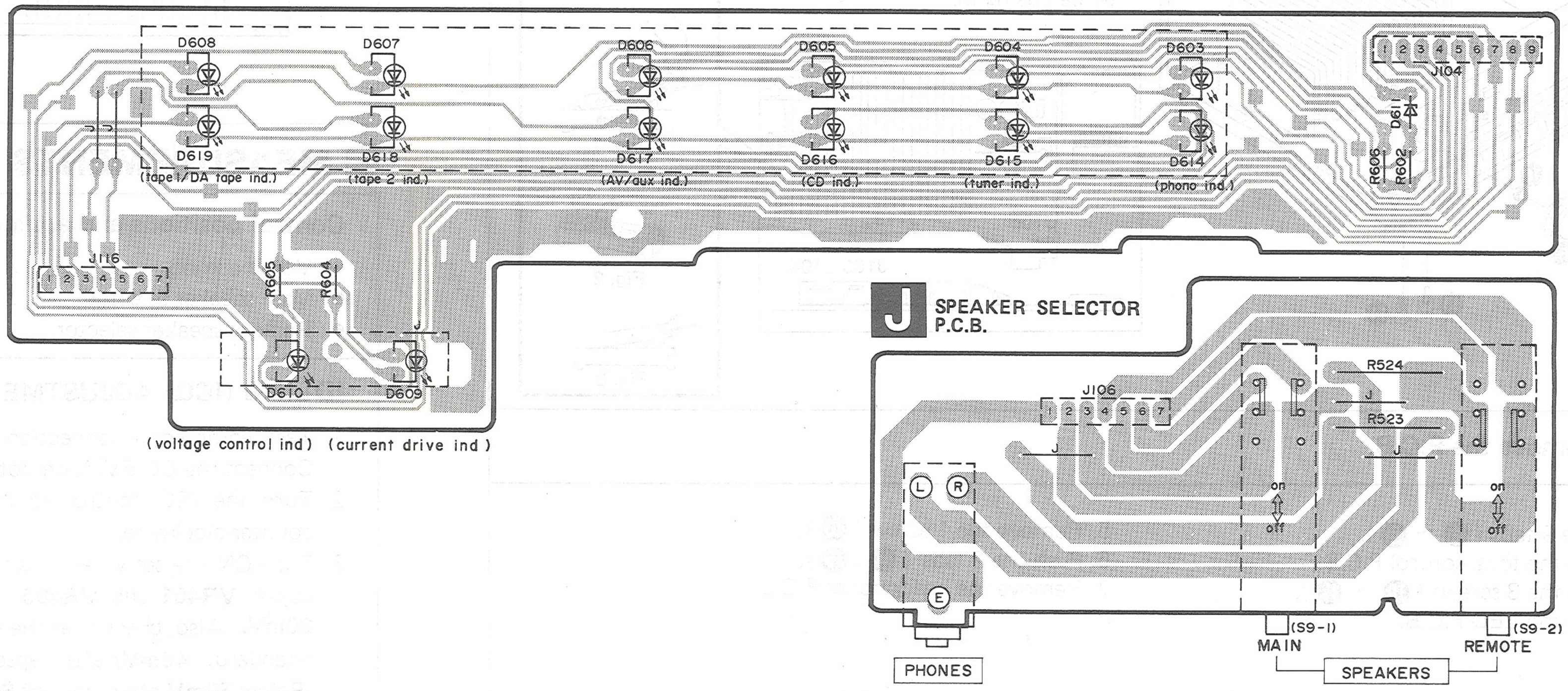

M
AC IN
(120V, 60Hz)
4
1
2
5
J201
J202
J201
J202
J203
J204
T1
K
1
2
3
C1
F1
5A
(S11)
POWER

G INPUT/OUTPUT SELECTOR P.C.B.

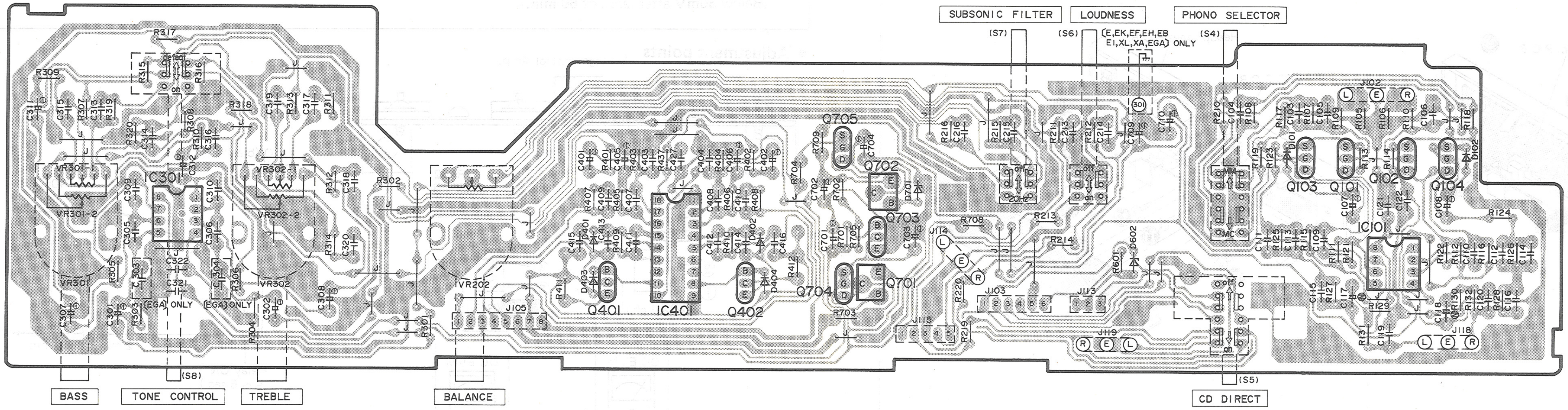

J109
J104
J112
J103
J111
J110
J117
on
off
tape2
source
tape1/DAtape
(S1-1)
PHONO
(S1-2)
TUNER
(S1-3)
CD
(S1-4)
AV/AUX
(S1-5)
TAPE2
(S1-6)
TAPE1/DA TAPE
INPUT SELECTOR
TAPE MONITOR

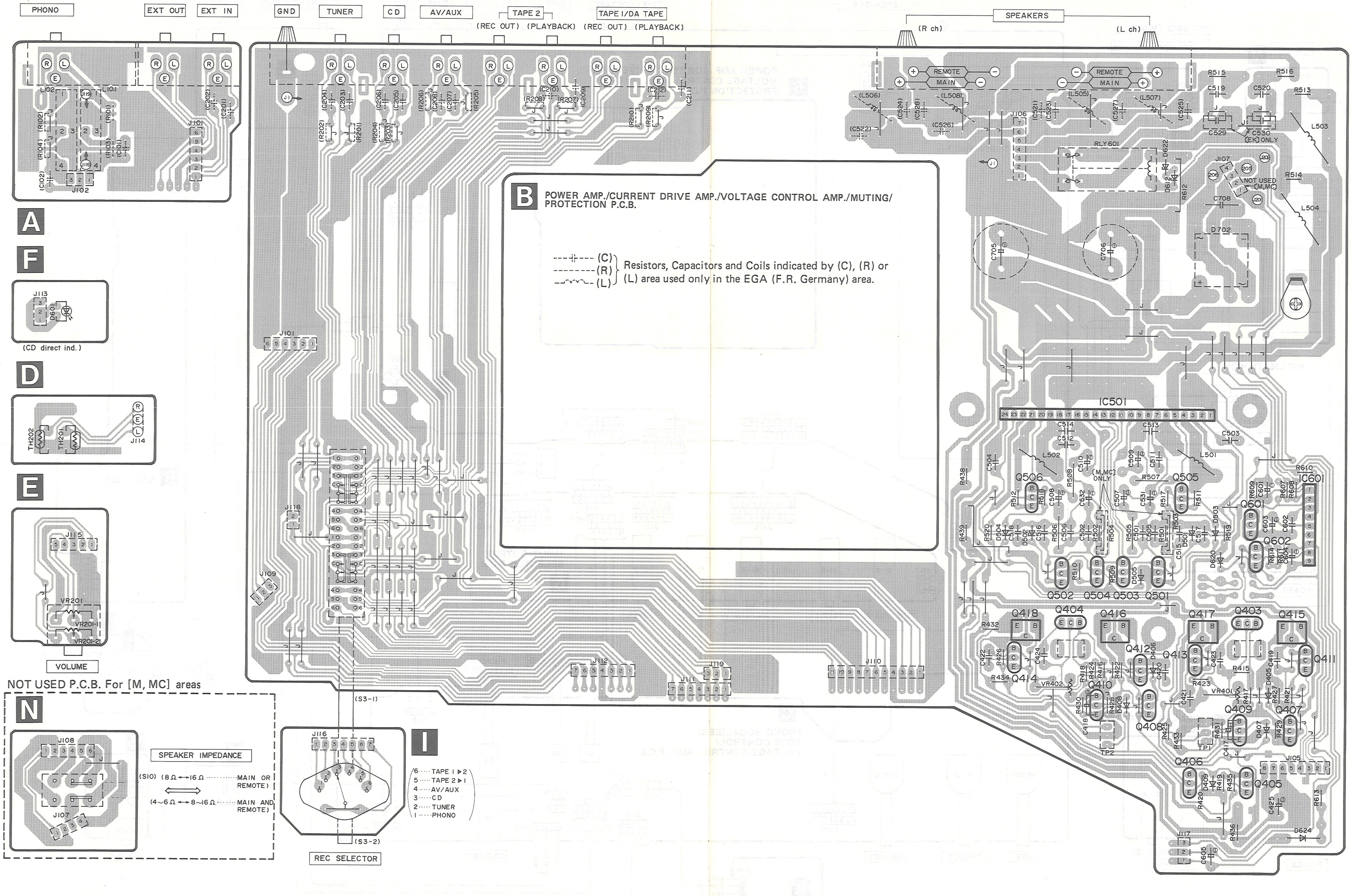
H LED P.C.B.

J SPEAKER SELECTOR P.C.B.


D608
D607
D606
D605
D604
D603
J104
D619
D618
D617
D616
D615
D614
D611
R606
R602
(tape1/DA tape ind.)
(tape 2 ind.)
(AV/aux ind.)
(CD ind.)
(tuner ind.)
(phono ind.)
J116
R605
R604
D610
D609
(voltage control ind)
(current drive ind)
J106
R524
R523
L
R
E
on
off
(S9-1)
MAIN
(S9-2)
REMOTE
PHONES
SPEAKERS

C PHONO EQUALIZER/ TONE CONTROL/ VOLTAGE CONTROL AMP. P.C.B.


SUBSONIC FILTER
LOUDNESS
PHONO SELECTOR
(S7)
(S6)
(E,EK,EF,EH,EB EI,XL,XA,EGA) ONLY
(S4)
R317
R309
R315
R316
defeat
C311
C315
R307
C313
R319
R320
C314
R308
R310
C316
R318
C319
R313
C317
R311
VR301-1
VR301-2
IC301
C309
C305
C306
C310
VR302-1
VR302-2
R312
R302
C318
R314
C320
C322
C321
C304
R306
C303
R305
VR301
C307
C301
R303
(EGA) ONLY
(EGA) ONLY
VR302
C302
R304
C308
R301
VR202
J105
C401
R401
C405
C403
R403
R437
C427
C404
R404
C406
R402
C402
R407
C409
R405
C407
R409
C408
R406
C410
R408
C415
D401
C413
C411
C412
R410
C414
D402
C416
R412
IC401
D403
Q401
Q402
D404
R411
R704
Q705
R709
C704
C702
R702
Q702
D701
C701
R701
R705
Q703
C703
J114
Q704
Q701
R703
R216
C216
R215
C215
R211
C213
R212
C214
C709
C710
R708
R213
R214
L
E
R
R220
R219
J103
J113
J115
J119
D602
R601
30
R210
C104
R108
R117
C103
R107
C105
R109
R105
R106
C106
R118
J102
D101
R119
R123
Q103
Q101
R113
R114
Q102
Q104
D102
MM
MC
C107
C121
C122
C108
R124
IC101
C111
R125
C113
R115
C109
R111
R121
R122
C112
R112
C110
R116
R126
C114
C115
C117
R127
R129
C118
R130
R132
C120
R128
C116
R131
C119
J118
(S5)
CD DIRECT
(S8)
BASS
TONE CONTROL
TREBLE
BALANCE


PHONO
EXT OUT
EXT IN
GND
TUNER
CD
AV/AUX
TAPE 2
(REC OUT) (PLAYBACK)
TAPE I/DA TAPE
(REC OUT) (PLAYBACK)
SPEAKERS
(R ch)
(L ch)
REMOTE
MAIN
A
F
(CD direct ind.)
D
E
VOLUME
N
I
REC SELECTOR
(S3-1)
(S3-2)
B
IC501
IC601
RLY601
NOT USED
[M,MC]
(EK) ONLY
(M,MC) ONLY
TP1
TP2

B POWER AMP./CURRENT DRIVE AMP./VOLTAGE CONTROL AMP./MUTING/PROTECTION P.C.B.

(C), (R), (L): Resistors, Capacitors and Coils indicated by (C), (R) or (L) area used only in the EGA (F.R. Germany) area.

NOT USED P.C.B. For [M, MC] areas

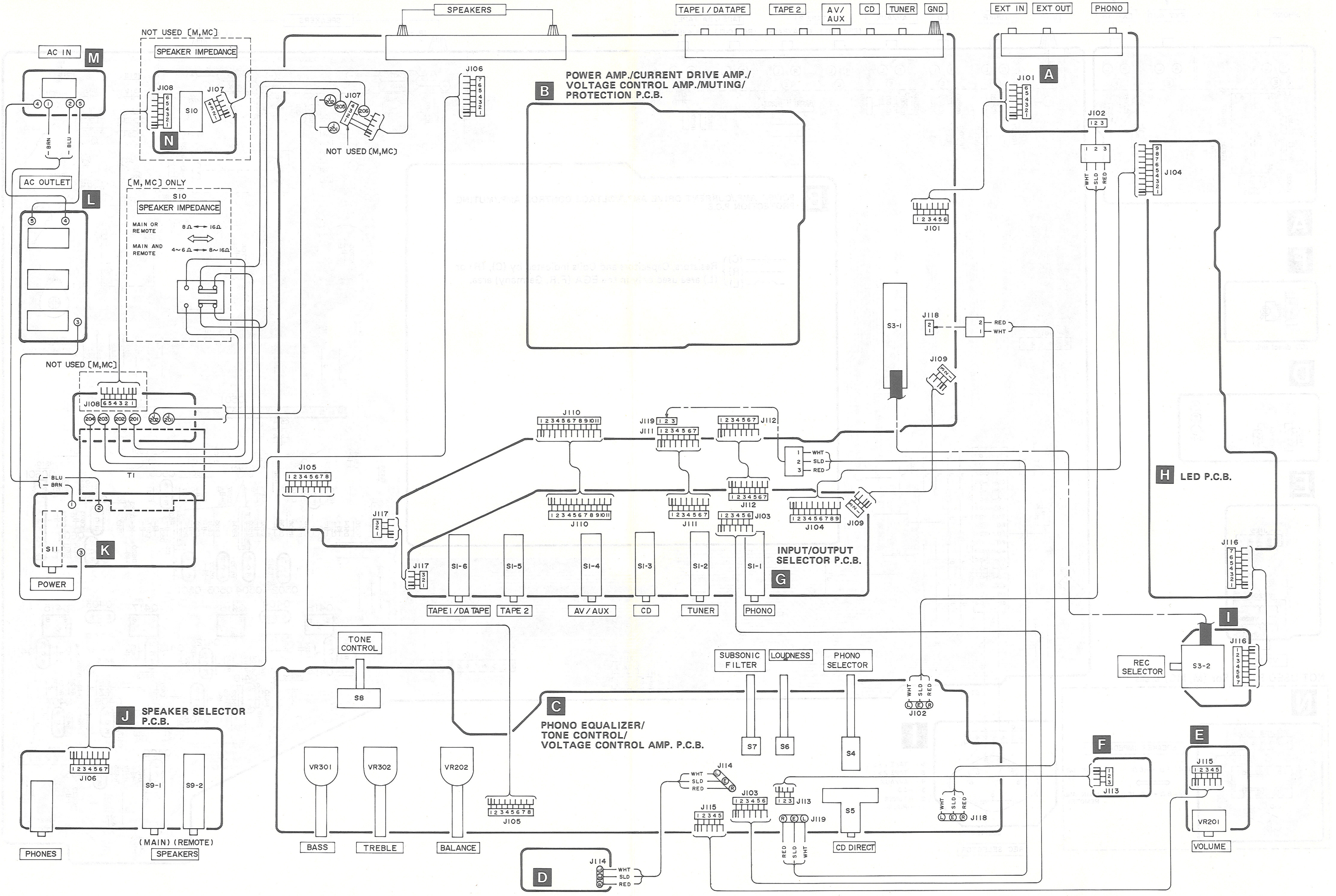
SPEAKER IMPEDANCE

(S10) (8Ω ⟷ 16Ω .... MAIN OR REMOTE)

(4~6Ω ⟷ 8~16Ω .... MAIN AND REMOTE)

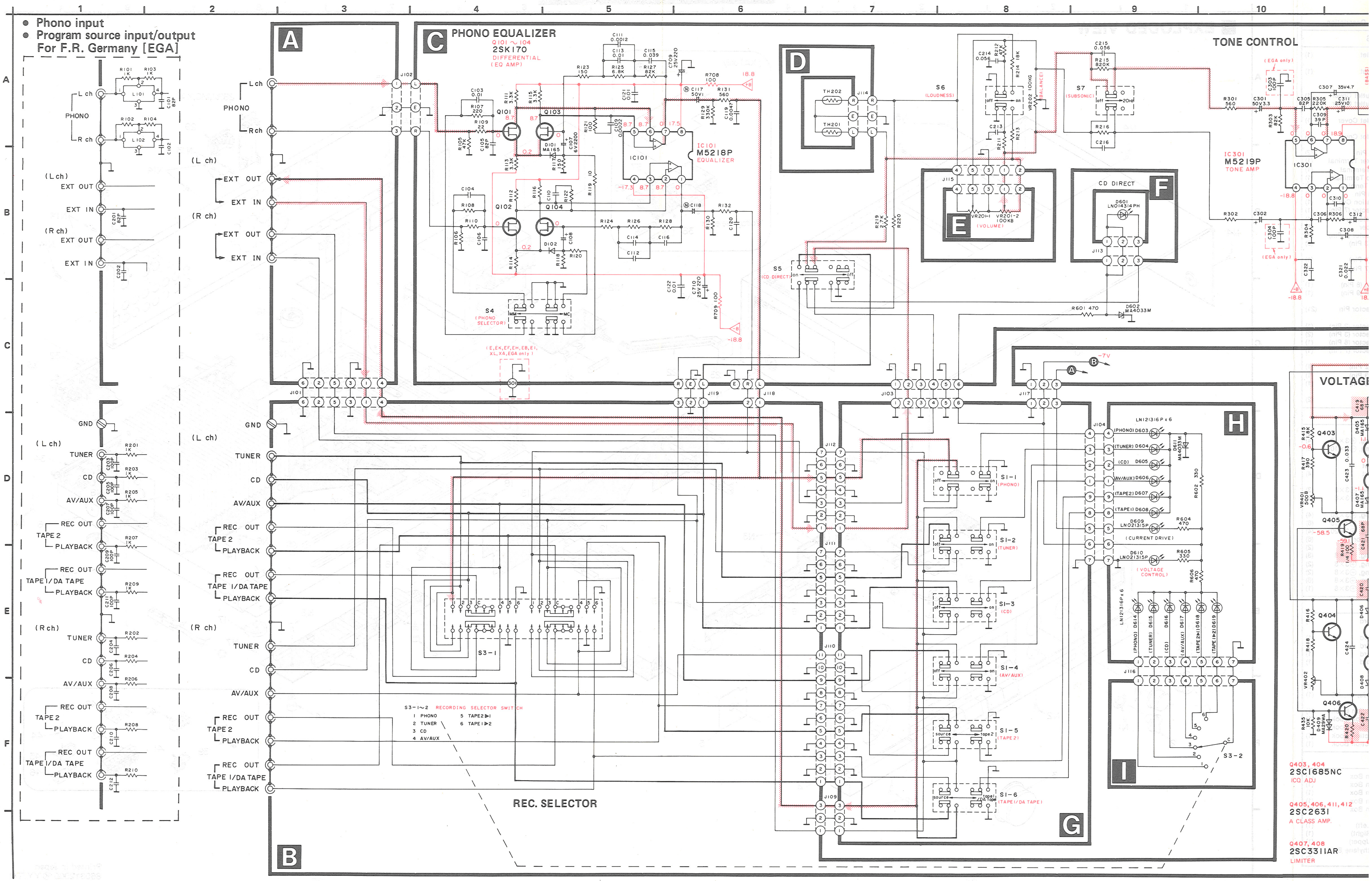
6 ···· TAPE 1 ▶ 2
5 ···· TAPE 2 ▶ 1
4 ···· AV/AUX
3 ···· CD
2 ···· TUNER
1 ···· PHONO

CIRCUIT BOARDS AND WIRING CONNECTION DIAGRAM

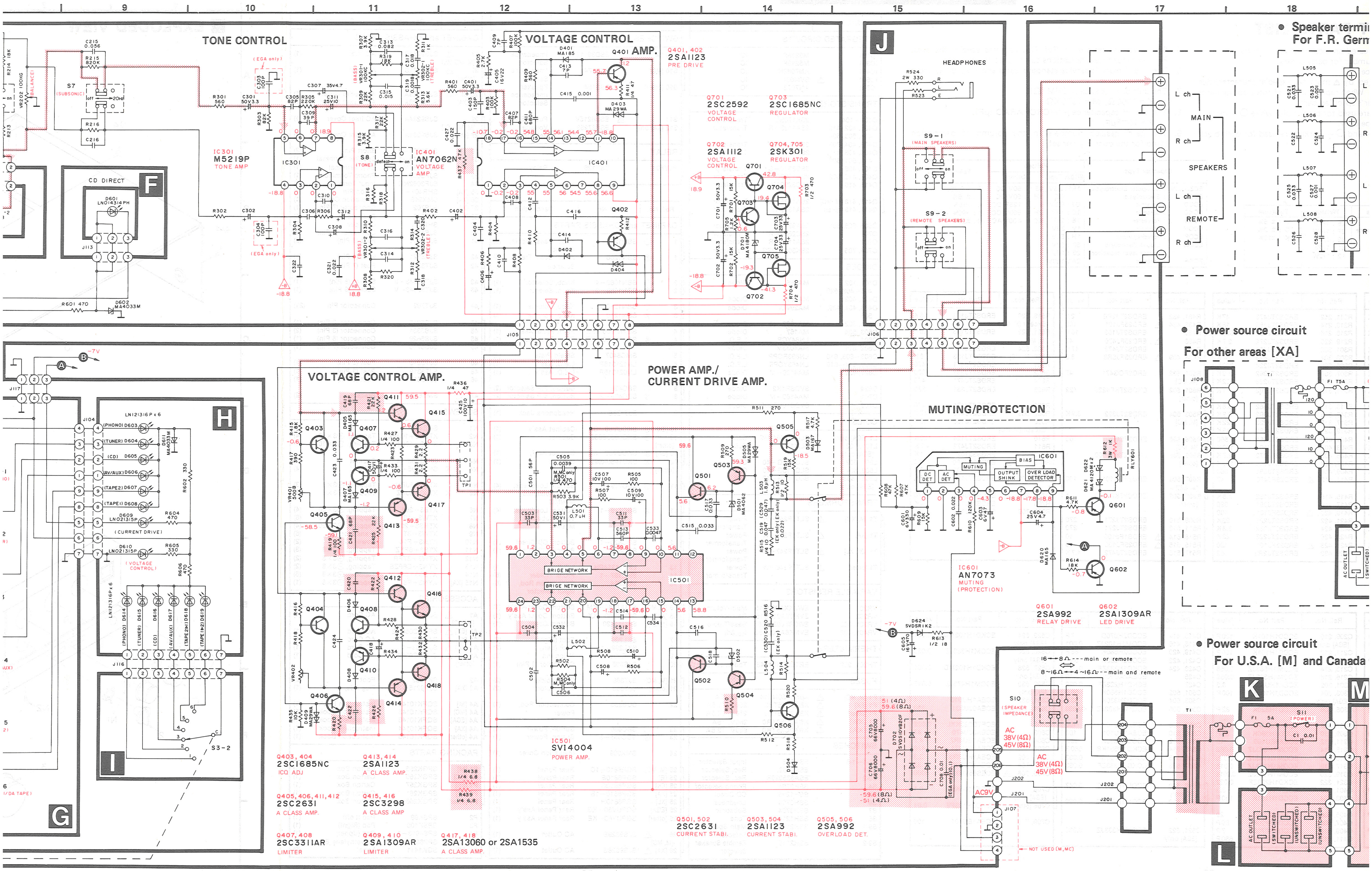

SPEAKERS
TAPE I / DATAPE
TAPE 2
AV/ AUX
CD
TUNER
GND
EXT IN
EXT OUT
PHONO
AC IN
M
NOT USED [M,MC]
SPEAKER IMPEDANCE
J108
J107
S10
N
BRN
BLU
AC OUTLET
L
J106
J107
202
205
206
201
NOT USED [M,MC]
B
POWER AMP./CURRENT DRIVE AMP./ VOLTAGE CONTROL AMP./MUTING/ PROTECTION P.C.B.
A
J101
J102
J104
J101
[M, MC] ONLY
S10
SPEAKER IMPEDANCE
MAIN OR REMOTE
8Ω ↔ 16Ω
MAIN AND REMOTE
4~6Ω ↔ 8~16Ω
S3-1
J118
RED
WHT
J109
NOT USED [M,MC]
J108
204
203
202
201
T1
BLU
BRN
J110
J119
J111
J112
WHT
SLD
RED
H
LED P.C.B.
J105
J117
J110
J111
J112
J103
J104
J109
S11
K
POWER
SI-6
SI-5
SI-4
SI-3
SI-2
SI-1
INPUT/OUTPUT SELECTOR P.C.B.
G
TAPE I / DA TAPE
TAPE 2
AV / AUX
CD
TUNER
PHONO
J116
I
TONE CONTROL
S8
SUBSONIC FILTER
LOUDNESS
PHONO SELECTOR
J102
REC SELECTOR
S3-2
J116
C
PHONO EQUALIZER/ TONE CONTROL/ VOLTAGE CONTROL AMP. P.C.B.
J
SPEAKER SELECTOR P.C.B.
J106
S9-1
S9-2
VR301
VR302
VR202
S7
S6
S4
F
E
J114
J103
J113
J115
J105
J115
S5
J119
J118
J113
VR201
PHONES
(MAIN) (REMOTE)
SPEAKERS
BASS
TREBLE
BALANCE
CD DIRECT
VOLUME
D
J114

- Phono input
- Program source input/output

For F.R. Germany [EGA]



1
2
3
4
5
6
7
8
9
10
A
B
C
D
E
F
PHONO
L ch
R ch
L101
L102
R101 1K
R103 1K
R102
R104
C101 82P
C102
(L ch)
EXT OUT
EXT IN
(R ch)
C201 82P
C202
GND
TUNER
CD
AV/AUX
REC OUT
TAPE 2
PLAYBACK
TAPE I/DA TAPE
R201 1K
R203 1K
R205 1K
R207 1K
R209 1K
R202
R204
R206
R208
R210
C203 100P
C205 100P
C207 100P
C209 100P
C211 100P
A
B
C
PHONO EQUALIZER
Q101 ~ 104
2SK170
DIFFERENTIAL
(EQ AMP)
Q101
Q102
Q103
Q104
D101 MA165
D102
IC101
M5218P
EQUALIZER
S4
(PHONO SELECTOR)
MM
MC
(E,EK,EF,EH,EB,EI, XL,X4,EGA only)
J101
J102
C111 0.0012
C113 0.01
C115 0.039
C709 25V220
C710 25V220
C117 50V1
R708 100
R709 100
R131 560
R132
18.8
-18.8
8.7
17.5
-17.3
0.2
D
TH202
TH201
J114
E
J115
VR201-1
VR201-2
100KB
(VOLUME)
S6
(LOUDNESS)
S5
(CD DIRECT)
S7
(SUBSONIC)
20Hz
VR202 100KG
(BALANCE)
R212 47K
R214 18K
C214 0.056
R211
R213
C213
R215 820K
C215 0.056
R216
C216
R219 2.7K
R220
F
CD DIRECT
D601
LN01431 4PH
J113
R601 470
D602
MA4033M
TONE CONTROL
IC301
M5219P
TONE AMP
(EGA only)
R301 560
C301 50V3.3
C302
R302
R303 82K
C303 100P
C304 100P
R304
C305 82P
R305 220K
C306
R306
C307 35V4.7
C308
C309 39P
C310
C311 25V10
C312
C321 0.022
C322
18.9
-18.8
J103
J117
J118
J119
-7V
G
J104
J109
J110
J111
J112
J116
S1-1 (PHONO)
S1-2 (TUNER)
S1-3 (CD)
S1-4 (AV/AUX)
S1-5 (TAPE 2)
S1-6 (TAPE I/DA TAPE)
off
on
source
tape 2
tape1
H
LN121316P x 6
(PHONO) D603
(TUNER) D604
(CD) D605
(AV/AUX) D606
(TAPE2) D607
(TAPE1) D608
D609
LN021315P
(CURRENT DRIVE)
D610
LN021315P
(VOLTAGE CONTROL)
D611
MA4033M
R602 330
R604 470
R605 330
R606 470
D614
D615
D616
D617
D618
D619
(TAPE2▶1)
(TAPE1▶2)
I
S3-2
S3-1
S3-1~2 RECORDING SELECTOR SWITCH
1 PHONO
2 TUNER
3 CD
4 AV/AUX
5 TAPE2▶1
6 TAPE1▶2
REC. SELECTOR
VOLTAGE
Q403
Q404
Q405
Q406
R415
R416
R417 390
R418
R419
R420
R435 10K
VR401 500B
VR402
D405 MA165
D406
D407 MA165
D408
D409 MA29WA
C419 68P
C421 68P
C420
C422
C423 0.033
C424
-0.6
-58.5
Q403, 404
2SC1685NC
ICQ ADJ
Q405, 406, 411, 412
2SC2631
A CLASS AMP.
Q407, 408
2SC3311AR
LIMITER


9
10
11
12
13
14
15
16
17
18
TONE CONTROL
IC301
M5219P
TONE AMP
S7
(SUBSONIC)
(BALANCE)
VR202 100KG
(EGA only)
S8
(TONE)
defeat
on
(BASS)
(TREBLE)
VOLTAGE CONTROL
IC401
AN7062N
VOLTAGE AMP
Q401 AMP.
Q401, 402
2SA1123
PRE DRIVE
Q701
2SC2592
VOLTAGE CONTROL
Q703
2SC1685NC
REGULATOR
Q702
2SA1112
VOLTAGE CONTROL
Q704, 705
2SK301
REGULATOR
J
HEADPHONES
S9-1
(MAIN SPEAKERS)
S9-2
(REMOTE SPEAKERS)
off
on
Speaker termi
For F.R. Germ
L ch
MAIN
R ch
SPEAKERS
L ch
REMOTE
R ch
F
CD DIRECT
D601
LN01431 4PH
J113
R601 470
D602
MA4033M
J105
J106
Power source circuit
For other areas [XA]
J108
T1
F1 T5A
VOLTAGE CONTROL AMP.
POWER AMP./
CURRENT DRIVE AMP.
MUTING/PROTECTION
H
J104
LN121316P x 6
(PHONO) D603
(TUNER) D604
(CD) D605
(AV/AUX) D606
(TAPE2) D607
(TAPE1) D608
D609
LN021315P
(CURRENT DRIVE)
D610
LN021315P
(VOLTAGE CONTROL)
J117
J116
LN121316P x 6
(PHONO) D614
(TUNER) D615
(CD) D616
(AV/AUX) D617
(TAPE2▸) D618
(TAPE1▸2) D619
I
S3-2
G
TP1
TP2
IC501
BRIGE NETWORK
BRIGE NETWORK
IC501
SVI4004
POWER AMP.
IC601
BIAS
MUTING
DC DET
AC DET
OUTPUT SHINK
OVER LOAD DETECTOR
RLY601
IC601
AN7073
MUTING
(PROTECTION)
Q601
2SA992
RELAY DRIVE
Q602
2SA1309AR
LED DRIVE
Power source circuit
For U.S.A. [M] and Canada
16→8Ω---main or remote
8~16Ω→4~16Ω---main and remote
S10
(SPEAKER IMPEDANCE)
AC
38V(4Ω)
45V(8Ω)
AC9V
J107
NOT USED (M, MC)
J202
J201
K
L
M
T1
F1 5A
S11
(POWER)
C1 0.01
AC OUTLET
(SWITCHED)
(UNSWITCHED)
Q403, 404
2SC1685NC
ICQ ADJ
Q413, 414
2SA1123
A CLASS AMP.
Q405, 406, 411, 412
2SC2631
A CLASS AMP.
Q415, 416
2SC3298
A CLASS AMP
Q407, 408
2SC3311AR
LIMITER
Q409, 410
2SA1309AR
LIMITER
Q417, 418
2SA13060 or 2SA1535
A CLASS AMP.
Q501, 502
2SC2631
CURRENT STABI.
Q503, 504
2SA1123
CURRENT STABI.
Q505, 506
2SA992
OVERLOAD DET.
51 (4Ω)
59.6 (8Ω)
-59.6 (8Ω)
-51 (4Ω)
(EGA only)
(EK only)

SCHEMATIC DIAGRAM

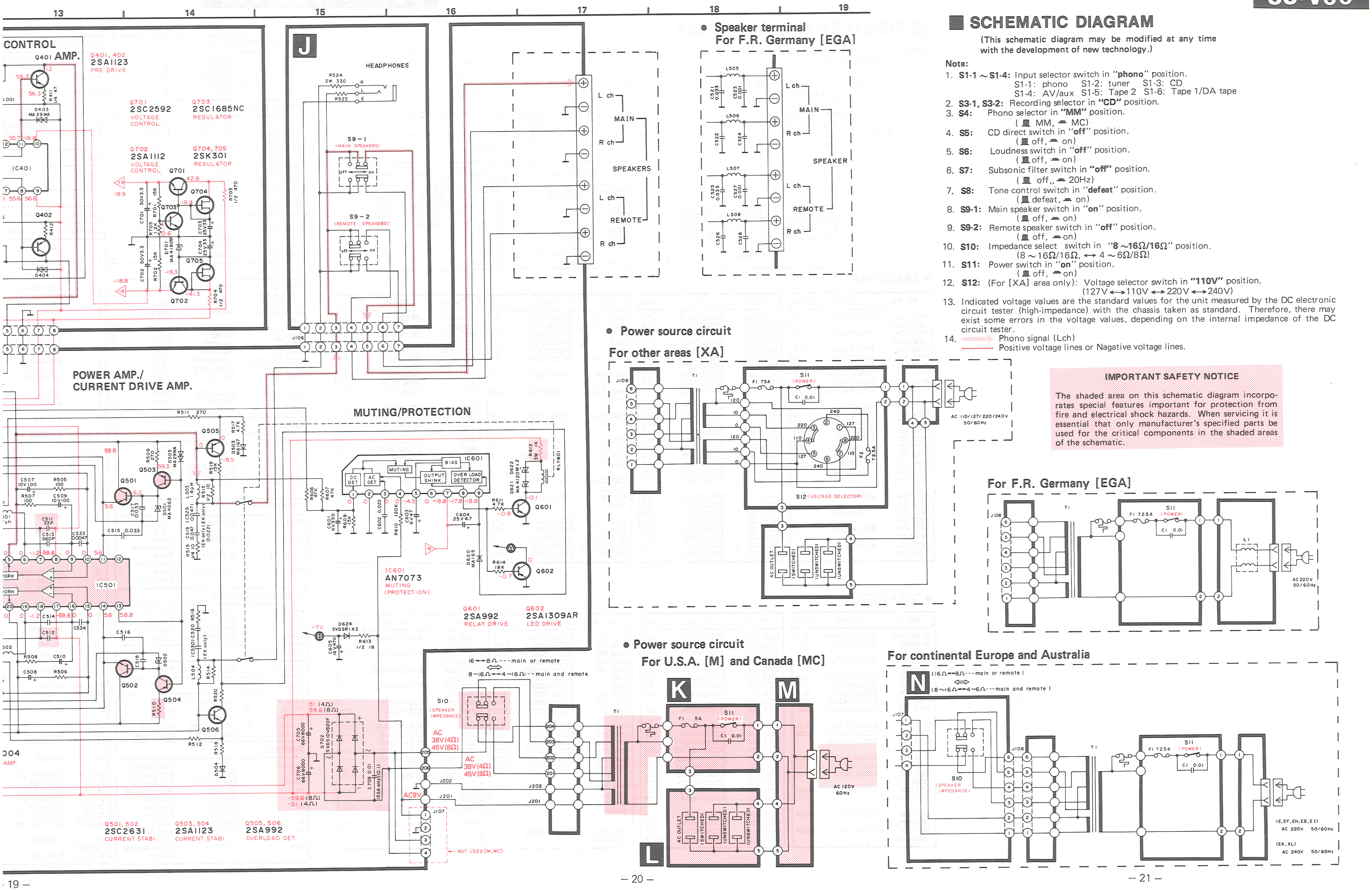
(This schematic diagram may be modified at any time with the development of new technology.)

Note:

1. **S1-1 ～ S1-4:** Input selector switch in "**phono**" position.
   S1-1: phono S1-2: tuner S1-3: CD
   S1-4: AV/aux S1-5: Tape 2 S1-6: Tape 1/DA tape
2. **S3-1, S3-2:** Recording selector in "**CD**" position.
3. **S4:** Phono selector in "**MM**" position.
   (■ MM, ▬ MC)
4. **S5:** CD direct switch in "**off**" position.
   (■ off, ▬ on)
5. **S6:** Loudness switch in "**off**" position.
   (■ off, ▬ on)
6. **S7:** Subsonic filter switch in "**off**" position.
   (■ off,, ▬ 20Hz)
7. **S8:** Tone control switch in "**defeat**" position.
   (■ defeat, ▬ on)
8. **S9-1:** Main speaker switch in "**on**" position.
   (■ off, ▬ on)
9. **S9-2:** Remote speaker switch in "**off**" position.
   (■ off, ▬ on)
10. **S10:** Impedance select switch in "**8 ～16Ω/16Ω**" position.
    (8 ～ 16Ω/16Ω, ↔ 4 ～ 6Ω/8Ω)
11. **S11:** Power switch in "**on**" position.
    (■ off, ▬ on)
12. **S12:** (For [XA] area only): Voltage selector switch in "**110V**" position.
    (127V ↔ 110V ↔ 220V ↔ 240V)
13. Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.
14. ▨ Phono signal (Lch)
    — Positive voltage lines or Nagative voltage lines.

IMPORTANT SAFETY NOTICE

The shaded area on this schematic diagram incorporates special features important for protection from fire and electrical shock hazards. When servicing it is essential that only manufacturer's specified parts be used for the critical components in the shaded areas of the schematic.


13
14
15
16
17
18
19
CONTROL AMP.
Q401
Q401, 402
2SA1123
PRE DRIVE
IC401
Q402
D403 MA29WA
D404
Q701
2SC2592
VOLTAGE CONTROL
Q703
2SC1685NC
REGULATOR
Q702
2SA1112
VOLTAGE CONTROL
Q704, 705
2SK301
REGULATOR
J
HEADPHONES
R524 2W 330
R523
S9－1
(MAIN SPEAKERS)
S9－2
(REMOTE SPEAKERS)
J106
L ch
R ch
MAIN
SPEAKERS
REMOTE
Speaker terminal
For F.R. Germany [EGA]
L505
L506
L507
L508
SPEAKER
POWER AMP./
CURRENT DRIVE AMP.
MUTING/PROTECTION
IC501
IC601
AN7073
MUTING
(PROTECTION)
DC DET
AC DET
BIAS
OUTPUT SHINK
OVER LOAD DETECTOR
Q501
Q502
Q503
Q504
Q505
Q506
Q601
Q602
Q601
2SA992
RELAY DRIVE
Q602
2SA1309AR
LED DRIVE
RLY601
D620 MA165
D621 D622 MA4120M×2
D624 SVDSR1K2
Q501, 502
2SC2631
CURRENT STABI.
Q503, 504
2SA1123
CURRENT STABI.
Q505, 506
2SA992
OVERLOAD DET.
S10
(SPEAKER IMPEDANCE)
16 ↔ 8Ω --- main or remote
8～16Ω ↔ 4～16Ω --- main and remote
AC 38V(4Ω) 45V(8Ω)
AC9V
J201
J202
J107
NOT USED (M, MC)
• Power source circuit
For other areas [XA]
J108
T1
F1 T5A
S11 (POWER)
C1 0.01
S12 (VOLTAGE SELECTOR)
AC OUTLET
(SWITCHED)
(UNSWITCHED)
AC 110/127/220/240V 50/60Hz
For F.R. Germany [EGA]
F1 T2.5A
AC220V 50/60Hz
• Power source circuit
For U.S.A. [M] and Canada [MC]
K
L
M
F1 5A
AC 120V 60Hz
For continental Europe and Australia
N
(16Ω ↔ 8Ω --- main or remote)
(8～16Ω ↔ 4～6Ω --- main and remote)
(E, EF, EH, EB, EI) AC 220V 50/60Hz
(EK, XL) AC 240V 50/60Hz

REPLACEMENT PARTS LIST

Notes:
1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety nitice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
3. Ⓚ — marked parts are used for black only, while ○ — marked parts are for silver type only.
4. Part other than Ⓚ — and ○ — marked are used for both black · and silver type.
5. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.
6. The "Ⓢ" mark is service standard parts and may differ from production parts.
7. The unit of resistance is OHM (Ω). K = 1000Ω, M = 1000KΩ
8. The unit of capacitance is MICROFARAD (μF). P = 10^{-6}μF.
9. The parenthesized numbers in the column of description stand for the quantity per set.

Resistor Type	Wattage	Tolerance
ERD : Carbon	25 : 1/4W	J : ± 5%
ERG : Metal Oxide	2F : 1/4W	G : ± 2%
ERC : Solid	S2 : 1/4W	K : ±10%
	S1 : 1/2W	
	12 : 1/2W	

Capacitor Type	Voltage		Tolerance
	ECEA Type	Other	
ECEA....N : Non-polar Electrolytic	2R3 : 2.3V DC	05 : 50V DC	C : ±0.25pF
ECEA : Electrolytic		1H : 50V DC	J : ± 5%
ECCD : Ceramic	OJ : 6.3V	1 : 125V DC	K : ±10%
ECKD : Ceramic	1C : 16V	2H : 500V DC	Z : +80%, −20%
ECQM : Polyester	1E : 25V	KC : 400V AC	M : ±20%
ECQV : Polyester	1V : 35V		
ECQP : Polypropylene	1H : 50V		
EECW : Liquid electrolyte double layer capacitor	50 : 50V 25 : 25V		
ECKF : Ceramic	2A : 100V		

● RESISTORS

Ref. No.	Part No.	Value
R101, 102 [EGA] only	ERDS2TJ102	1K
R103, 104 [EGA] only	ERDS2TJ102	1K
R105, 106	ERDS2TJ473	47K
R107, 108	ERDS2TJ221	220
R109, 110	ERDS2TJ220	22
R111, 112	ER0S2TKG3301	3.3K
R113, 114	ERDS2TJ332	3.3K
R115, 116	ER0S2TKG3301	3.3K
R117, 118	ERDS2TJ151	150
R119, 120	ERDS2TJ100	10
R121, 122	ERDS2TJ101	100
R123, 124	ERDS2TJ151	150
R125, 126	ERDS2TJ682	6.8K
R127, 128	ERDS2TJ823	82K
R129, 130	ERDS2TJ334	330K
R131, 132	ERDS2TJ561	560
R201, 202 [EGA] only	ERDS2TJ102	1K
R203, 204 [EGA] only	ERDS2TJ102	1K
R205, 206 [EGA] only	ERDS2TJ102	1K
R207, 208 [EGA] only	ERDS2TJ102	1K
R209, 210 [EGA] only	ERDS2TJ102	1K
R211, 212	ERDS2TJ473	47K
R213, 214	ERDS2TJ183	18K
R215, 216	ERDS2TJ824	820K
R219, 220	ERDS2TJ272	2.7K
R301, 302	ERDS2TJ561	560
R303, 304	ERDS2TJ823	82K
R305, 306	ERDS2TJ224	220K
R307, 308	ERDS2TJ392	3.9K
R309, 310	ERDS2TJ223	22K
R311, 312	ERDS2TJ102	1K
R313, 314	ERDS2TJ562	5.6K
R315, 316	ERDS2TJ392	3.9K
R317, 318	ERDS2TJ223	22K
R319, 320	ERDS2TJ183	18K
R401, 402	ERDS2TJ561	560
R403, 404	ERDS2TJ104	100K
R405, 406	ERDS2TJ272	2.7K
R407, 408	ERDS2TJ104	100K
R409, 410	ERDS2TJ561	560
R411, 412 ⚠	ERD25FJ470	47
R415, 416	ERDS2TJ182	1.8K
R417, 418	ERDS2TJ391	390
R419, 420 ⚠	ERD25FJ101	100
R421, 422	ERDS2TJ223	22K
R423, 424	ERDS2TJ332	3.3K
R425, 426	ERDS2TJ223	22K
R427, 428 ⚠	ERD25FJ101	100
R429, 430	ERDS2TJ2R2	2.2
R431, 432	ERDS2TJ2R2	2.2
R433, 434 ⚠	ERD25FJ101	100
R435	ERDS2TJ103	10K
R436 ⚠	ERD25FJ470	47
R437	ERDS2TJ473	47K
R438, 439 ⚠	ERD25FJ6R8	6.8
R501, 502 [M, MC]	ERD2FCG471	47
R501, 502 [other]	EROS2TKF4220	422
R503, 504 [M, MC]	ERDS2TJ392	3.9K
R505, 506 [M, MC]	ERD2FCG101	100
R505, 506 [other]	EROS2TKF1000	1
R507, 508 [M, MC]	ERD2FCG101	100
R507, 508 [other]	EROS2TKF1000	1
R509, 510	ERDS2TJ271	270
R511, 512	ERDS2TJ271	270
R513, 514 ⚠	ERDS1FJ100	10
R515, 516 ⚠	ERD25FJ100	10
R517, 518	ERDS2TJ472	4.7K
R519, 520 Except [M, MC]	ERDS2TJ153	15K
R521, 522 [M, MC]	ERDS2TJ153	15K
R523, 524	ERG2SJ331	330
R529 [M, MC]	ERDS2TJ153	15K
R601	ERDS2TJ471	470
R602	ERDS2TJ331	330
R604	ERDS2TJ471	470
R605	ERDS2TJ331	330
R606	ERDS2TJ471	470
R607, 608	ERDS2TJ473	47K
R609 Except [M, MC]	ERDS2TJ153	15K
R610	ERDS2TJ124	120K
R611	ERDS2TJ472	4.7K
R612	ERG3SJ102	1K
R613 ⚠	ERDS1FJ180	18
R614	ERDS2TJ183	18K
R701, 702	ERDS2TJ153	15K
R703, 704 ⚠	ERDS1FJ471	470
R705	ERDS2TJ122	1.2K
R708, 709	ERDS2TJ101	100

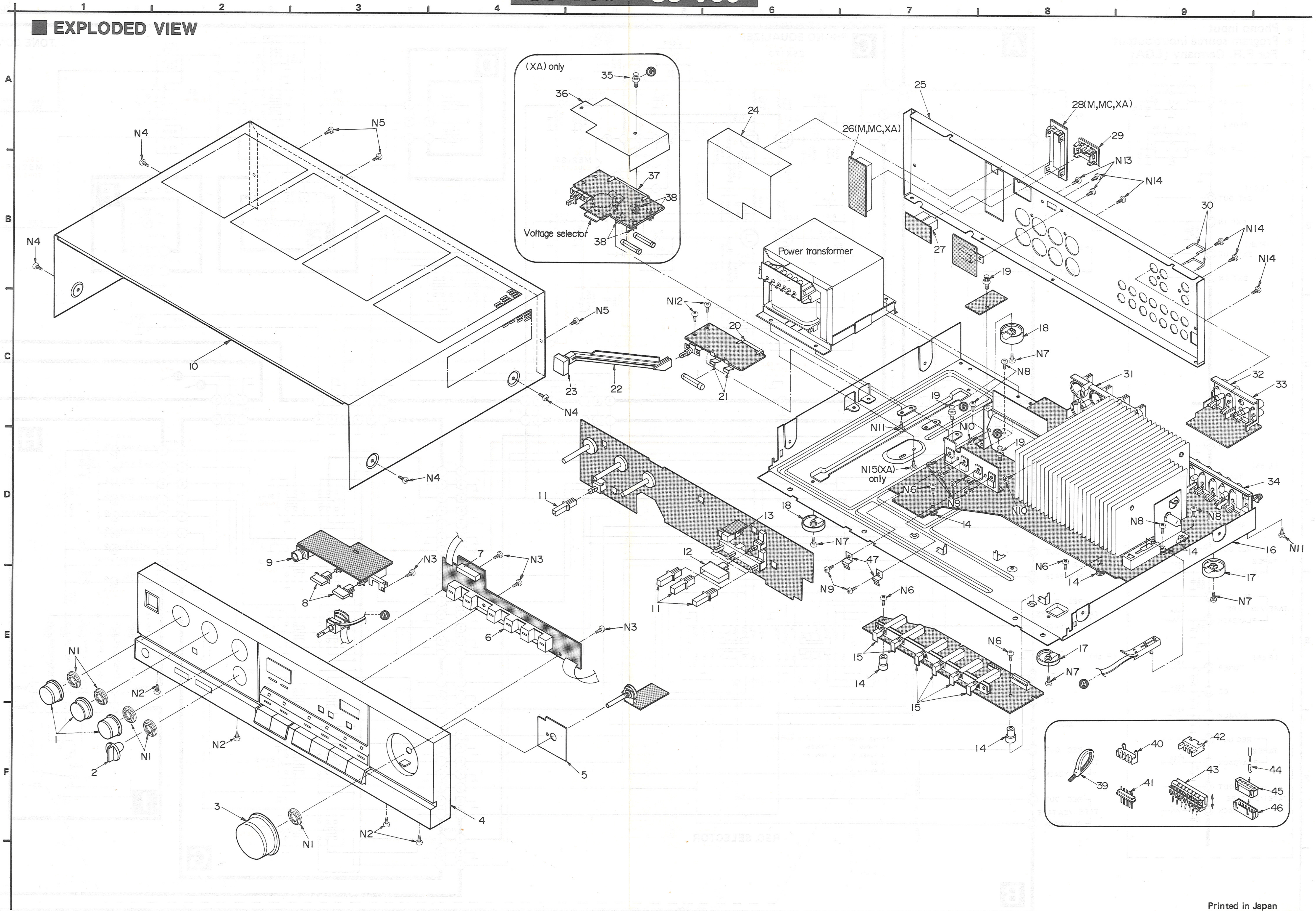
● CAPACITORS

Ref. No.	Part No.	Value
C1 [EK] only	ECKDKC103PF2	0.01
C1 [other]	ECKDNS103ZV	0.01
C101, 102 [EGA] only	ECCD1H820K	82P
C103, 104	ECQM1H103JZ	0.01
C105, 106	ECCD1H820K	82P
C107, 108	ECEA0JU222	2200
C109, 110	ECQM1H222JZ	0.0022
C111, 112	ECQM1H222JZ	0.0022
C113, 114	ECQM1H103JZ	0.01
C115, 116	ECQM1H393JZ	0.039
C117, 118 Ⓝ ⚠	ECEA1HN010S	1
C119, 120	ECQM1H472JZ	0.0047
C121, 122	ECKD1H103ZF	0.01
C201, 202 [EGA] only	ECCD1H820K	82P
C203, 204 [EGA] only	ECCD1H101K	100P
C205, 206 [EGA] only	ECCD1H101K	100P
C207, 208 [EGA] only	ECCD1H101K	100P
C209, 210 [EGA] only	ECCD1H101K	100P
C211, 212 [EGA] only	ECCD1H101K	100P
C213, 214	ECQM1H563JZ	0.056
C215, 216	ECQM1H563JZ	0.056
C301, 302	ECEA1HU3R3	3.3
C303, 304 [EGA] only	ECCD1H101K	100P
C305, 306	ECCD1H820K	82P
C307, 308	ECEA1VU4R7	4.7
C309, 310	ECCD1H390K	39P
C311, 312	ECEA1EU100	10
C313, 314	ECQM1H823JZ	0.082
C315, 316	ECQM1H153JZ	0.015
C317, 318	ECQM1H183JZ	0.018
C319, 320	ECQM1H182JZ	0.0018
C321, 322	ECKD1H223ZF	0.022
C401, 402	ECEA1HU3R3	3.3
C403, 404	ECCD1H151K	150P
C405, 406	ECEA1CU220	22
C407, 408	ECCD1H820K	80P
C409, 410	ECCD1H070D	7P
C411, 412	ECKD1H681KB	680P
C413, 414	ECCD2H070D	7P
C415, 416	ECQM1H102JZ	0.001
C419, 420	ECCD2H680K	68P
C421, 422	ECCD2H680K	68P
C423, 424	ECKD1H333ZF	0.033
C425	ECEA2AU100	10
C427	ECKD1H223ZF	0.022
C501, 502	ECCD1H560K	56P
C503, 504	ECCD2H330K	33P
C505, 506	ECQM1H392JZ	0.0039
C507, 508	ECEA1AU101	100
C509, 510	ECEA1AU101	100
C511, 512	ECCD2H330K	33P
C513, 514	ECKD1H561KB	560P
C515, 516	ECKD1H333ZF	0.033
C517, 518	ECKD1H333ZF	0.033
C519, 520 [EK] only	ECQM1H473JZ	0.047
C519, 520 [other]	ECQM1H223JZ	0.022
C521, 522 [EGA] only	ECQM1H333JZ	0.033
C523, 524 [EGA] only	ECKD1H102MD	0.001
C525, 526 [EGA] only	ECQM1H333JZ	0.033
C527, 528 [EGA] only	ECKD1H102MD	0.001
C529, 530 [EK] only	ECQM1H473JZ	0.047
C531, 532	ECEA1HU010	1
C601	ECEA0JU331	330
C602	ECFTD223KXL	0.022
C603	ECEA0JU470	47
C604	ECEA1EU4R7	4.7
C605	ECEA1CU471	470
C701, 702	ECEA1HU3R3	3.3
C703, 704	ECEA1EU330	33
C705, 706 ⚠	ECES66V802U	8000
C708 [EGA] only	ECQE2104KS	0.1
C708 [other]	ECKD2H103PE	0.01
C709, 710	ECEA1EU101	100

Ref. No.	Part No.	Description
INTEGRATED CIRCUITS		
IC101	M5218P	IC
IC301	M5219P	IC
IC401	AN7062N	IC
IC501 ⚠	SVI4004	IC
IC601	AN7073	IC
TRANSISTORS		
Q101∼104	2SK170BLV	Transistor
Q401, 402, 413, 414, 503, 504	2SA1123−R	Transistor
Q403, 404, 703	2SC1685RST	Transistor
Q405, 406, 411, 412, 501, 502	2SC2631−R	Transistor
Q407, 408	2SC3311−Q	Transistor
Q409, 410, 602	2SA1309Q	Transistor
Q415, 416	2SC3298AY	Transistor
Q417, 418 [M, MC]	2SA1535RLS	Transistor
Q417, 418 [other]	2SA1306AY	Transistor
Q505, 506, 601	2SA992E	Transistor
Q701	2SC2592−R	Transistor
Q702	2SA1112−R	Transistor
Q704, 705	2SK301−QRS	Transistor
DIODES		
D101, 102, 405∼408, 620	MA165	Diode
D401, 402	MA185	Diode
D403, 404, 409, 505	MA29WA	Diode
D501, 502	MA4062−M	Diode
D503, 504	MA167	Diode
D601	LN84YCP	L.E.D.
D602, 611	MA4033M	Diode
D603∼608, 610	LN863RCPP	L.E.D.
D609, 614∼619	LN463YCPP	L.E.D.
D621, 622	MA4120−M	Diode
D624	SVDSR1K2	Diode
D701	MA4180−M	Diode
D702	SVDS10VB20F	Diode
COILS		
L1 [EGA] only	SLQZ650MH49	Coil
L101, 102 [EGA] only	SLM1Z33	Coil
L501, 502	SLQY07G−40	Coil
L503, 504	SLQY18G−10	Coil
L505∼508 [EGA] only	SLQY07G−40	Coil
TRANSFORMERS		
T1 [M, MC] ⚠	SLT5P245−W	Power Transformer
T1 [XA] ⚠	SLT5P248−W	Power Transformer
T1 [EK, XL] ⚠	SLT5P247−W	Power Transformer
T1 [other] ⚠	SLT5P246−W	Power Transformer
VARIABLE RESISTORS		
VR201	EWJKXA090B15	Main Volume
VR202	EVH0YA015G15	Balance
VR301, 302	EWCRYA023C15	Bass/Treble
VR401, 402	EVNK6AA00B52	I_{CQ} Adj.
THERMISTERS		
TH201, 202	ERTD2ZHL104S	Thermisters
FUSES		
F1 [M, MC] ⚠	XBA1F50NU14	125V, 5A
F1 [EK] ⚠	XBA2C25TB0	250V, T2.5A
F1 [other] ⚠	XBA2C25TR0	250V, T2.5A
F1 [XA] ⚠	XBA2C50TR0	250V, T5A
F2 [XA] ⚠	XBA2C25TR0	250V, T2.5A
SWITCHES		
S1-1∼1-6	SSH656	Input Selector
S3-1	ESA2682	Rec. Selector
S3-2	ESA335029B	Rec. Selector
S4	SSH3704	Phono Selector
S5	SSH1215	CD Direct
S6	SSH3704	Loudness
S7	SSH3704	Subsonic
S8	SSH1214	Tone
S9-1	SSH2115	Main Speaker Selector
S9-2	SSH2115	Remote Speaker Selector
S10 [M]	ESD3911T	Impedance Selector
S10 [MC]	SSS174	Impedance Selector
S10 [other]	SSS154	Speaker Impedance Selector
S11 ⚠	ESB8215V	Power Source
S12 [XA] only	ESE37263	Voltage Selector
RELAY		
RLY601	SSY126	Relay

Ref. No.	Part No.	Description
CABINET and CHASSIS PARTS		
1 ○	SBN1207−1	Knob, Bass, Treble, Balance (3)
1 Ⓚ	SBN1206	Knob, Bass, Treble, Balance (3)
2 ○	SBN1089−4	Knob, Selector (1)
2 Ⓚ	SBN1089−3	Knob, Selector (1)
3 ○	SBN1210−1	Knob, Volume (1)
3 Ⓚ	SBN1210	Knob, Volume (1)
4 ○	SGWUV60−SE	Front Panel Ass'y (1)
4 Ⓚ	SGWUV60−KE	Front Panel Ass'y (1)
5	SMC6407	Shield Plate (1)
6	LN121316P	L.E.D. Ass'y (1)
7	LN021315P	L.E.D. Ass'y (1)
8 ○	SBC439	Button, S.P Selector (2)
8 Ⓚ	SBC439−2	Button, S.P Selector (2)
9	SJJ126B	Headphone Jack (1)
10 [EK] ○	SKCUV60−SK	Cabinet Ass'y (1)
10 [other] ○	SKC1960S982	Cabinet (1)
10 [EK] Ⓚ	SKCUV60−KK	Cabinet Ass'y (1)
10 [other] Ⓚ	SKC1960K992	Cabinet (1)
11 ○	SBC719	Button, Loudness, Tone, Subsonic, MM/MC (4)
11 Ⓚ	SBC719−1	Button, Loudness, Tone, Subsonic, MM/MC (4)
12 ○	SBC820−1	Button, CD Direct (1)
12 Ⓚ	SBC820	Button, CD Direct (1)
13	LN014314PH	L.E.D. (1)
14	SHE187−1	P.C.B. Holder (8)
15	SUB254	Connection Rod, Input Selector (6)
16 [M, MC]	SKUUV60−KM	Bottom Cover Ass'y (1)
16 [XA]	SKUUV60−KX	Bottom Cover Ass'y (1)
16 [other]	SKU11420	Bottom Cover (1)
17	SKL299	Foot (Right) (2)
18	SKL299−1	Foot (Left) (2)
19	SHR401−1	Nylon Pin (3)
20	SJS305	Connector (3 Pin) (1)
21 [M, MC]	SJT389	Fuse Holder (2)
21 [other]	SJT388	Fuse Holder (2)
22	SUB256	Connection Rod, Power (1)
23 ○	SBC666	Button, Power (1)
23 Ⓚ	SBC666−3	Button, Power (1)
24	SMX909	Insulation Cover (1)
25 [M, MC]	SGP6810−1C	Rear Panel (1)
25 [E]	SGP6810E	Rear Panel (1)
25 [EK]	SGP6810G	Rear Panel (1)
25 [XA]	SGP6810−1B	Rear Panel (1)
25 [XL]	SGP6810H	Rear Panel (1)
25 [EGA]	SGPUV60−KG	Rear Panel Ass'y (1)
25 [other]	SGPUV60−KE	Rear Panel Ass'y (1)
26 [M, MC] ⚠	SJS9329B	AC Outlet (1)
26 [XA] ⚠	SJS9328B	AC Outlet (1)
27 [M, MC, XL] ⚠	SJS9234B	AC Inlet (1)
27 [other] ⚠	SJS9231B	AC Inlet (1)
28 [M, MC]	SJS9329A	AC Outlet Cover (1)
28 [XA]	SJS9328A	AC Outlet Cover (1)
29 [M, MC, XL]	SJS9234A	AC Inlet Cover (1)
29 [other]	SJS9231A	AC Inlet Cover (1)
30	SJP9205−2	Short Pin (2)
31	SJF4815−1	Speaker Terminal (1)
32	SJF3057N	EXT. Terminal (1)
33	SJF3057−5N	Phono Terminal (1)
34	SJF3062NK	Input Terminal (1)
35 [XA]	SHR401−1	Nylon Pin (1)
36 [XA]	SMX916	Insulation Cover (1)
37 [XA]	SJS702	Connector (7 Pin) (1)
38 [XA]	SJT347	Fuse Holder (4)
39	SHR301	Clamper (5)
40	SJS5341	Connector (3 Pin) (1)
41	SJT3311	Post (3 Pin) (3)
42	SJT3321	Post (3 Pin) (1)
42	SJT3711	Post (7 Pin) (1)
43	SJT30843−V	Socket (8 Pin) (1)
43	SJT30943−V	Socket (9 Pin) (1)
44	SJT783	Connector Pin (21)
45	SJS5215	Connector (2 Pin) (1)
45	SJS5331	Connector (3 Pin) (2)
45	SJS5629	Connector (6 Pin) (1)
45	SJS5715	Connector (7 Pin) (1)
46	SJT3213	Post (2 Pin) (1)
46	SJT3319	Post (3 Pin) (1)
46	SJT3611	Post (6 Pin) (1)
47	SMY897	Bracket (2)
SCREWS		
N1	SNE4021	Nut (5)
N2	XTBS3+10JFZ1	Tapping, ⊕3×10 (4)
N3	XTB3+10GFR	Tapping, ⊕3×10 (4)
N4 ○	SNE2095−4	Cabinet (4)
N4 Ⓚ	SNE2095−5	Cabinet (4)
N5 ○	XTB3+8JFN	Tapping, ⊕3×8 (3)
N5 Ⓚ	XTB3+8JFZ	Tapping, ⊕3×8 (3)
N6	XTB3+20J	Tapping, ⊕3×20 (4)
N7	XTW3+10T	Tapping, ⊕3×10 (6)
N8	XTBS3+20F1	Tapping, ⊕3×20 (4)
N9	XTW3+8T	Transistor (6)
N10	XYN3+F14	Power IC (2)
N11	XTB3+8FFZ	Tapping, ⊕3×8 (8)
N12	XTW3+8TFR	Tapping, ⊕3×8 (2)
N13	XYN3+C6FZS	Tapping, ⊕3×8 (2)
N14	XTBS3+8JFZ1	Tapping, ⊕3×8 (6)
N15 [XA]	XYN3+F8	Tapping, ⊕3×8 (1)
ACCESSORIES		
A1 [M, MC] ⚠	SJA172	AC Cord (1)
A1 [EK] ⚠	SFDAC05G02	AC Cord (1)
A1 [XL] ⚠	SJA173	AC Cord (1)
A1 [XA] ⚠	SJA168−1	AC Cord (1)
A1 [other] ⚠	SFDAC05E03	AC Cord (1)
A2	SKL302	Foot (2)
A3 [XA]	SJP9215	Plug Adaptor, AC (1)
A4 [M]	SQFK10142	Instruction Book (1)
A4 [MC]	SQFK10143	Instruction Book (1)
A4 [EGA]	SQFK10146	Instruction Book (1)
A4 [XA]	SQFK10144	Instruction Book (1)
A4 [other]	SQFK10145	Instruction Book (1)
PACKING PARTS		
P1 [M]	SPGK255	Carton Box (1)
P1 [MC]	SPGK260	Carton Box (1)
P1 [EK]	SPGK257	Carton Box (1)
P1 [EF]	SPGK261	Carton Box (1)
P1 [other]	SPGK256	Carton Box (1)
P2	SPSK99	Pad (Left) (1)
P3	SPSK100	Pad (Right) (1)
P4	SPS4613−1	Pad (Upper) (1)
P5	SPP653	Polyethylene Bag (1)
P6 [EF]	SGK1411	Label (2)

EXPLODED VIEW


1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
(XA) only
35
36
37
38
Voltage selector
38
24
25
26(M,MC,XA)
27
28(M,MC,XA)
29
N13
N14
30
N14
N14
Power transformer
19
18
N7
N8
31
32
33
34
N4
N5
N4
10
N5
N4
N4
N12
20
22
23
22
21
19
N11
N10
19
N15(XA) only
N6
N9
N10
N8
N8
14
16
N11
17
N7
11
13
18
N7
47
N9
12
11
N6
14
N6
14
15
15
15
14
N6
17
N7
14
9
8
7
N3
N3
N3
6
N1
N2
1
2
N1
N2
3
N1
N2
4
5
39
40
41
42
43
44
45
46

Printed in Japan
860312000 Ⓚ YY/TM

ORDER NO. HAD8603408C0–A

Stereo Integrated Amplifier

SU-V60

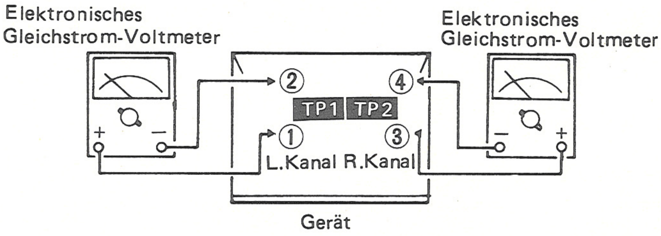
MESSUNGEN UND JUSTIERUNGEN

Einstellungen der Bedienelemente und zu verwendende Geräte

- Lautstärkeregler . . . . . ∞
- Hauptlautsprecher-Wahlschalter . . . . . off
- Nebenlautsprecher-Wahlschalter . . . . . off
- Lautsprecherimpedanz-Schalter . . . . . 8Ω ~ 16Ω
- Elektronisches Gleichstrom-Voltmeter

LEERLAUF-(ICQ)-JUSTIERUNG

1. Anschlußverbindungen wie gezeigt vornehmen. (Das Gleichspannungs-Voltmeter an beide Kanäle anschließen.)
2. Die ICQ-Volumenregler (**VR401, VR402**) entgegen dem Uhrzeigersinn drehen.
3. Das Gerät einschalten, wenn es kalt ist, und 15 Sekunden später **VR401** und **VR402** so justieren, daß die Spannung **20mV** beträgt. Ebenfalls überprüfen, daß die Spannung nach Ablauf von **10 – 15** Minuten zwischen **38 – 47mV** (Standardwert ist **40mV**) liegt. (Nach Ablauf von **60** Minuten: unter **50mV**)


Elektronisches Gleichstrom-Voltmeter
Elektronisches Gleichstrom-Voltmeter
②
④
TP1
TP2
①
③
L.Kanal
R.Kanal
Gerät

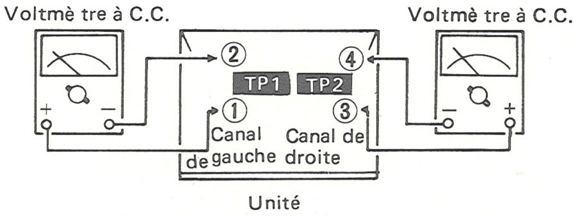
MESURAGES ET RÉGLAGES

Positions de réglage et équipement utilisé

- Bouton du volume . . . . . ∞
- Sélecteur du haut-parleur principal . . . . . hors circuit
- Sélecteur du haut-parleur auxiliaire . . . . . hors circuit
- Sélecteur d'impedance des enceints . . . . . 8Ω ~ 16Ω
- Voltmetres électroniques à C.C. (EVM).

RÉGLAGE DU TEMPS MORT (ICQ)

1. Effecture le raccordement comme il est montré. (Raccorder le voltmètre à C.C. sur les deux canaux.)
2. Tourner le volume de contrôle de ICQ (**VR401, VR402**) dans sens inverse des aiguilles d'une montre. des aiguilles d'une montre.
3. Mettre l'appareil en marche lorsqu'il est froid, et 15 sec. plus tard, régler **VR401** et **VR402** de telle sorte que la tension soit de **20mV**. Vérifier aussi que la tension soit de **38 – 47mV** (normale: **40mV**) après un intervalle de **10 – 15** minutes. (Au-dessous de **50mV**, après un intervalle de **60** min.)



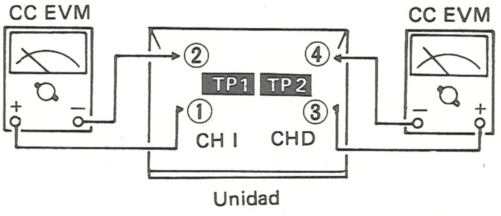
MEDICIONES Y AJUSTE

Posiciones de control y equipo usádo

- Perilla de volumen . . . . . ∞
- Selector de altavoz principal . . . . . off (desconectado)
- Selector de altavoz remoto . . . . . off
- Selector de impedancia de altavoces . . . . 8Ω ~ 16Ω
- Voltímetro electrónico de CC (EVM)

AJUSTE DE MARCHA EN VACÍO (ICQ)

1. Hacer la conexión como se muestra. (Conectar el voltímetro de CC en ambos canales.)
2. Girar el volumen de control ICQ (**VR401, VR402**) a la izquierda.
3. Prender el aparato cuando está frío y, 15 seg. más tarde, ajustar **VR401** y **VR402** de manera que el voltaje sea **20mV**. También, comprobar que el voltaje sea **38 – 47mV** (estandard: **40mV**) después de un lapso de **10 – 15** minutos. (Inferior a **50mV** después de un lapso de **60** min.)



Printed in Japan
860306000Ⓚ Y.Y

ORDER NO. HAD8605538S8

Service Manual

Supplement

Stereo Integrated Amplifier

Amplifier

SU-V60

Color

(K)	Black Type
(S)	Silver Type

Color	Area
(K)(S)	[E] ..... Continental Europe
(K)(S)	[EH] .... Holland
(K)(S)	[EB] .... Belgium
(K)(S)	[EF] .... France
(K)(S)	[EK] .... United Kingdom
(K)(S)	[EGA] ... F.R. Germany
(K)(S)	[Ei] ..... Italy
(K)(S)	[XL] .... Australia
(K)(S)	[XA] .... Asia, Latin America, Middle Near East, Africa & Oceania

Please use this manual together with the service manual for Model No. SU-V60, Order No. HAD8603408C0.

■ CORRECTION

Kindy correct the before repair and adjustment (page 4) in the service manual of SU-V60 as follows.

■ BEFORE REPAIR AND ADJUSTMENT

(1) Turn off the power supply. Using a 10Ω, 5W resistor, shortcircuit both ends of power supply capacitors **(C503, C504, 6800μF)** in order to discharge the voltage.

⬇

■ BEFORE REPAIR AND ADJUSTMENT

(1) Turn off the power supply. Using a 10Ω, 5W resistor, shortcircuit both ends of power supply capacitors **(C705, C706, 8000μF)** in order to discharge the voltage.

Technics

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan
Printed in Japan
860505678 Ⓚ YY